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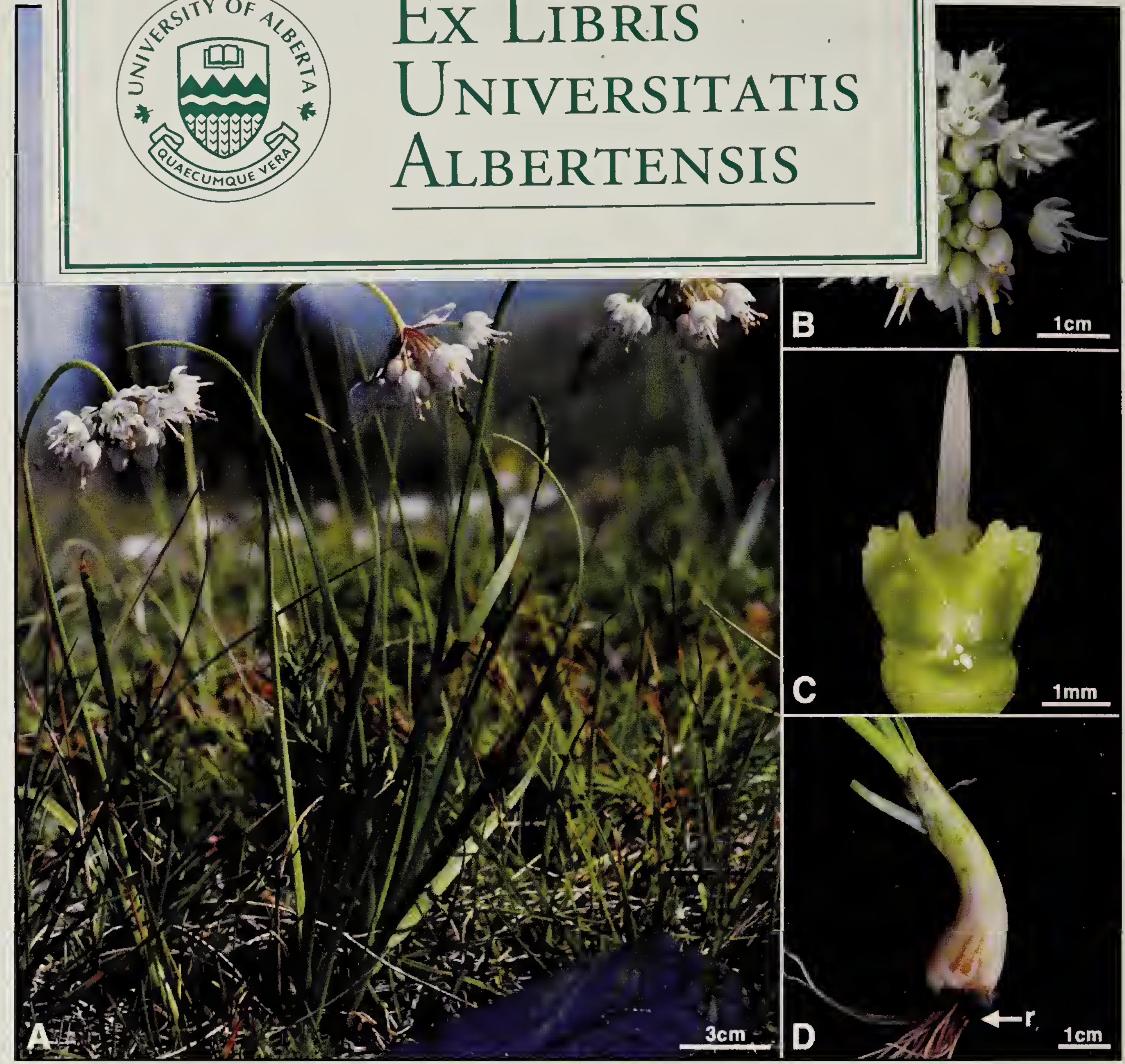

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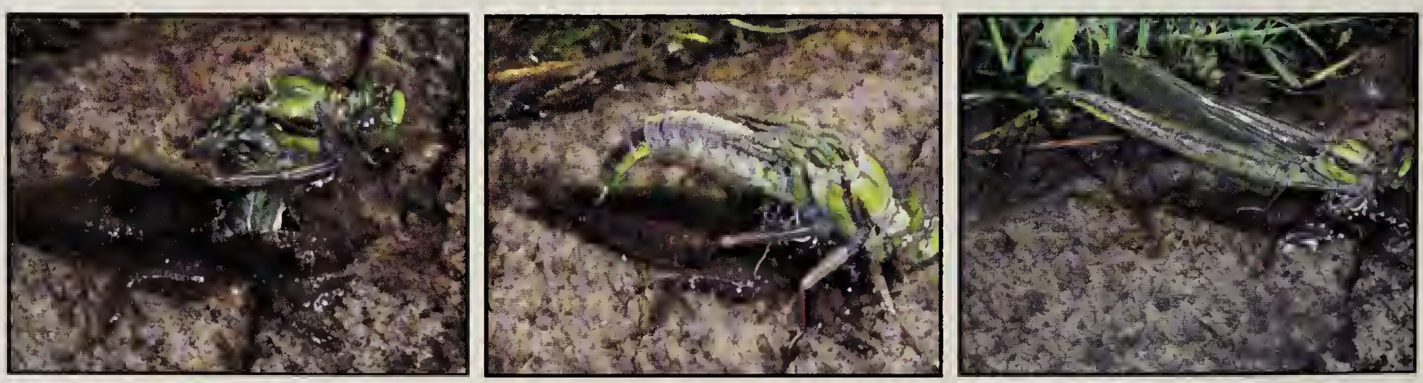

Figure 3. Horned Clubtail (Arigomphus cornutus) *emerging at Pinawa Pond, MB, on 10 June 2008. See article by M. Hughes on p. 242.* *David Hughes*

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AMERICAN AVOCET OBSERVATIONS AND BREEDING OCCURRENCES IN THE BOREAL REGIONS OF ALBERTA: 1999 – 2003

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The American Avocet (Fig. 1) is a large shorebird of the prairies, and the northern limit of the breeding range is currently defined as an area just south of 54°N latitude in central Alberta (Fig. 2), which is the approximate latitude of Edmonton.[7] A historic record shows that they have bred farther north to the southern Mackenzie area near Rae, NWT.[4] Specimens collected in the nineteenth century from Fort Resolution, NWT, and Fort Chipewyan and Lesser Slave Lake in Alberta showed that they ranged farther north than their current distribution.[4] Francis and Lumbis reported breeding of avocets on the Syncrude site, near Ft. McMurray, with production of young in 1977 and 1978.[3] Gulley recorded a number of observations of American Avocets north of Fort McMurray primarily in May of 1977 and 1980 – 1982.[5] Kuyt reported an observation by a local resident of a flock of 12 avocets on wetlands 35 km northwest of Fort Smith, NWT, in the summer of 1988.[6] In the Atlas of Breeding Birds of Alberta, Semenchuk noted extralimital breeding of the American Avocet in the McLennan area west of Lesser Slave Lake,[8] while the Second edition of the atlas indicates confirmed breeding farther northwest near the town of Peace River.[2]

Figure 1. American Avocet.
Gerard W. Beyersbergen

I conducted shorebird surveys throughout the boreal regions of Alberta from 1999 through 2003 (Fig. 2). During these surveys, American Avocets were observed nesting (Fig. 3) or were otherwise present in the wetland landscape. Surveys were conducted aerially at Hay-Zama Lakes and the Peace-Athabasca Delta and on the ground at Kimiwan Lake and in the High Level area.

Peace Athabasca Delta

My first recorded observations of American Avocets in the boreal region

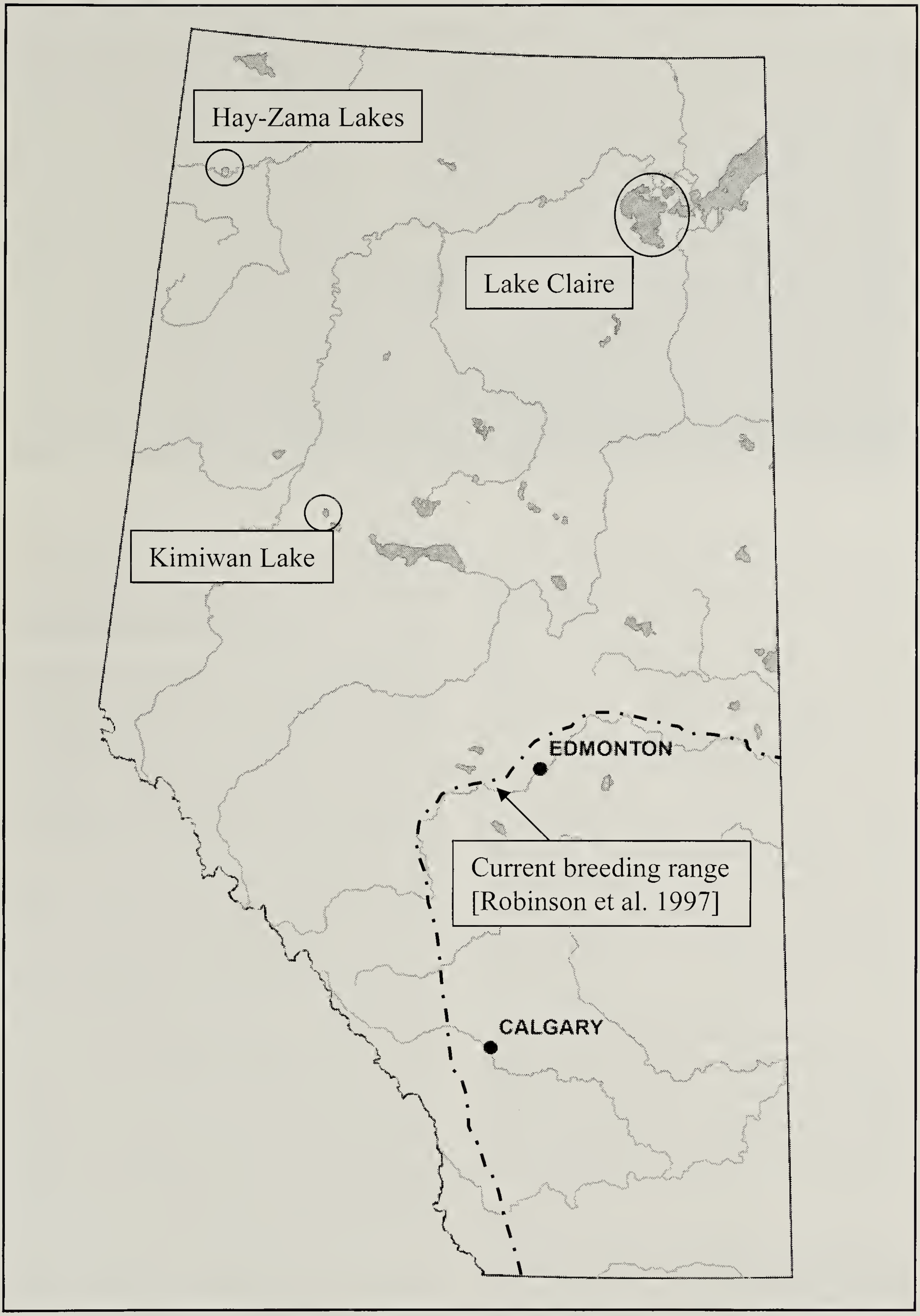

Figure 2. Northern limit of the American Avocet breeding range and extensions in the boreal region of Alberta. *Gillian Turney*

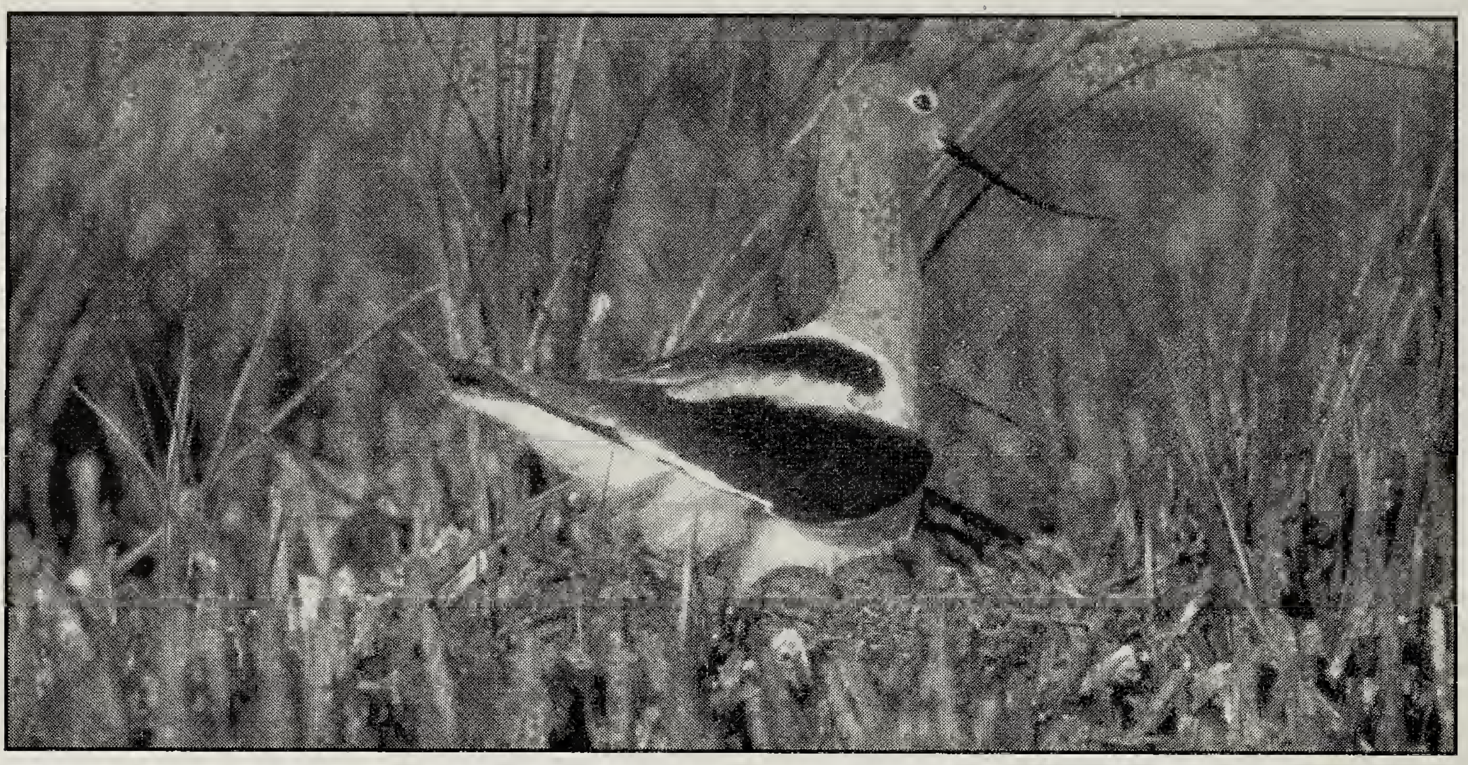

Figure 3. American Avocet on nest. *Gerard W. Beyersbergen*

occurred during aerial surveys of the Peace Athabasca Delta in the spring and summer of 1999.[1] A complete circuit of the lakes in the delta required 2 days of flying, and four sets of these surveys were conducted that year. Observations were made in May and July, and the bulk of the observations of American Avocet occurred in basins surrounding Lake Claire (Table 1) in the western quadrant of the Peace Athabasca Delta. The Birch River delta is located on the southwest corner of Lake Claire; Welstead Lake and a basin locally referred to as Frog Lake are in the southeast, and the wetland basin locally referred to as Lynx Stand are in the northeast quadrant of Lake Claire. All of these basins had shallow water zones along bare or sparsely vegetated shorelines, which is the preferred habitat for American Avocets for feeding and nesting.

In total, 51 adults were observed in the first survey, and observations dropped by nearly half in the second survey, 6 days later (Table 1). I assumed that many of these adults had initiated nesting, were sitting on nests away from the shoreline, and were not flushed by the aircraft and therefore could not be observed. However, some of these adults may have continued farther north into the NWT as was noted in earlier years by Kuyt.[6]

The first fall survey in late July found 91 American Avocets on the same wetlands where avocets had been observed in the spring period (Table 1). This is a minimum estimate of observed birds because aerial surveys of Welstead Lake recorded only one American Avocet, while five birds were observed in the same area during a ground check on the same day. From the air, no differentiation was made as to the age category of these birds. It is likely that a number of these birds may have been young of the year resulting from the breeding efforts of some of the 27 to 51 adults observed during the two spring surveys. Successful nesting in the Peace Athabasca Delta was confirmed through observations of adults with flightless young at Lynx Stand basin during 1999 field studies by another researcher in the area (L. Carbyn, Canadian Wildlife Service, pers. comm.). The final survey was completed on 11 August, when only one American Avocet remained.

Waterfowl surveys conducted in the Peace Athabasca Delta in the spring of

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Table 1. American Avocet observations during the 1999 aerial shorebird surveys of the Peace Athabasca Delta.

Waterbody	Date	Number of birds	Comment
Survey One			
Lynx Stand basin	May 24	24	Flocked along south shore of basin
Birch River delta wetlands	May 25	2	Pair
Welstead Lake	May 25	25	Flock, not differentiated into pairs during survey
Survey total		**51**	
Survey Two			
Lynx Stand basin	May 30	14	2 pairs, group of 10 (pairs)
Birch River delta wetlands	May 31	8	4 pairs
Welstead Lake	May 31	3	Pair and lone adult
Frog Lake	May 31	2	Pair
Survey total		**27**	
Survey Three			
Lynx Stand basin	July 24	7	2 single birds, group of 5
Mamawi Lake	July 24	1	Single bird on small basin off main lake
Frog Lake	July 25	17	Single bird, group of 4 and flock of 12
Welstead Lake	July 25	1	Single bird
Birch River delta wetlands	July 25	65	Scattered along shoreline of south basin in delta
Survey total		**91**	
Survey Four			
Birch River delta wetlands	August 11	1	Single bird
Survey total		**1**	

2000 recorded observations of American Avocets on delta wetlands (M. Gendron, Ducks Unlimited Canada, pers. comm.), confirming continued use of the delta.

Hay-Zama Lakes/High Level

The first reported observations of American Avocets on Hay-Zama Lakes were made during an airboat survey of the complex on 21 June 2001 (K. Morton, Alberta Sustainable Resource Development, pers. comm.). Morton found three pairs nesting on the complex, which included a pair with a nest of four eggs and an adult with two young.

In 2001, during two aerial waterfowl surveys of the entire Hay-Zama Lakes complex by K. Wright, Alberta Conservation Association, I participated as an observer to check for shorebird use of the area as a migration stopover site (unpublished data). Thousands of shorebirds were observed, but no

Table 2. American Avocet observations during the 2002 aerial shorebird surveys of the Hay-Zama wetland complex.

Waterbody	Date	Number of birds	Comment
Survey One			
Sand Lake	May 20	5	Group of three and a pair on NE shoreline
Slough 3	May 20	6	Three pairs scattered along the south shoreline
North Zama Lake	May 20	3	A pair and single adult on the east shoreline
Survey total		14	
Survey Two			
Duck Lake	August 13	10	Group of 10 birds along the shoreline
West Hay Lake	August 13	1	Lone bird on east shoreline
Survey total		**11**	

American Avocets were detected from the aircraft in either the spring or fall flight.

The shorebird observer effort was repeated as part of the waterfowl survey in the spring of 2002. A minimum of 14 adult American Avocets were observed from the air (Table 2). Only those birds that flushed or were highly visible on the bare shoreline would be detected, so any birds that remained roosting or were nesting, especially in the shoreline vegetation, would not have been recorded.

A survey of the entire complex was conducted in August by a team of two observers in a rotary-winged aircraft on 13 August 2002. In total, 11 American Avocets were recorded but no age class was distinguished, so it is unknown if breeding had occurred that year on the wetland complex (Table 2).

Two aerial shorebird surveys were conducted on Hay-Zama Lakes in May 2003, but the complex was completely flooded well into the willows, and suitable shorebird habitat was unavailable that spring. However, during a tour of the area around High Level for other waterbird species, a pair of American Avocets was observed on 16 May 2003 on Linton Lake, which is located about 4 km southwest of La Crete.

Kimiwan Lake

Kimiwan Lake was surveyed as part of the prairie-wide aerial shorebird surveys in 1987 (A.R. Smith and H.L. Dickson, unpublished data), and American Avocets were reported on the lake during the spring survey on 21 May when six adults were observed. The lake was surveyed twice again in the fall, and on 4 September, two avocets were observed.

Two partial surveys were conducted on Kimiwan Lake in 2001, and the area was scanned from select vantage points on the south end at the boardwalk and from the west shore near the channel outlet. The highest number of American Avocets was recorded during the second survey (Table 3). No effort was made to search for nesting birds. However, given the number of birds present on the lake, it is quite likely that nesting did occur that year.

Table 3. American Avocet observations during the 2001-03 ground shorebird surveys of Kimiwan Lake.

Year	Survey Date				
2001				May 22	May 30
				62	180
2002		May 16	May 19	May 22	
		302	1066	1081	
2003	May 14	May 19		May 24	May 27
	10	9		9	0

A 2-year study of shorebird migration staging on Kimiwan Lake was initiated in May 2002. The entire perimeter of the lake was checked on foot and by ATV, where feasible. Wide expanses of open mudflats were present around the waterbody, and conditions were ideal for staging migrant shorebirds. The survey period was shortened because of logistical problems, and the survey effort concluded on 22 May. American Avocets were present on the lake in large numbers with a peak count of 1081 adults occurring on the last survey day (Table 3). The number of avocets did not vary much between the last two survey days, so it is likely that the maximum number of birds that would use the lake that year were recorded on the last survey. Numerous nesting pairs were observed throughout the three surveys, but no nests were physically checked or disturbed.

Precipitation was low in the winter of 2002-2003 in the Kimiwan Lake area, and water levels dropped in the lake. The bare shoreline from the previous spring was completely vegetated with a variety of unidentified herbaceous plants, and suitable shorebird habitat was at a premium. Migrant shorebird numbers were the highest in 2003 during the first survey on 14 May and declined during successive surveys (unpublished data). American Avocet numbers were down considerably from the previous spring, with a peak daily count of only 10 adults being recorded that spring (Table 3). Nesting may have occurred at the lake but was not recorded.

The occurrence of nesting birds has occurred for enough years and with enough regularity that it is clear that the breeding range of the species has expanded beyond the current estimated range near Edmonton. Some of these occurrences may have been a result of poor wetland conditions on the prairies, but the regularity and number of consistent observations in the boreal region indicate that a breeding tradition has been established in the boreal region.

Acknowledgments

Thanks to those individuals, as noted in the article, who provided observations of American Avocets during the course of their work in the boreal region. Special thanks to Ken Wright for allowing me to ride along during his surveys of the Hay-Zama Lakes wetland complex. Thanks to Gillian Turney for fitting me into her busy schedule and producing the figure. Helpful comments were provided by W. A. Calvert.

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* * *

Striped skunks in winter. *Christian Artuso*

DO EARED GREBES ENGAGE IN FLIGHT DURING COURTSHIP?

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Abstract

Courtship displays of Eared Grebes were observed at two locations in Saskatchewan for a total of 12 h, and 14 cases of flight involving either one or two birds were recorded. In most occurrences, the grebes became fully airborne; however, it was not clear whether they were simply retreating from conspecifics to continue courtship with a selected partner in isolation. I suggest that these flights, especially when two grebes take off simultaneously, may be ritualized and represent a courtship display behaviour on their own.

Introduction

Grebes (Podicipedidae) are a family of waterbirds that rarely fly outside migration. The majority of their members maintain the necessary architecture and minimum of wing musculature for direct, rapid flight. However, since the wings are not needed much in daily life, grebes develop functional flightlessness for part of the year.[3] The courtship rituals of the different species of grebes generally do not include elements of flight. Only in the Retreat Ceremony known from the Great Crested Grebe and other *Podiceps* species, a low dashing kind of flight with the feet paddling over the water surface occurs when one partner in a pair retreats from a common bout of head-shaking.

Similarly to other grebes, Eared Grebes rarely fly except during migration.[1] Eared Grebes using Mono Lake in California for long stays during their autumn migration become flightless while they feed to obesity, and their flight muscles may lose up to 50% of their mass. Before continuing their migration, conspicuous wing-flapping exercises are used to rebuild wing muscles.[4] A similar, though less dramatic, cycle is repeated at the breeding locations.[5] McAllister did not mention any element of real flight in the courtship of the species.[6] A kind of pattering across the water with wings flapping, similar to the retreat of the Great Crested Grebe, is thus far the only element reported being similar to flight. It is used to escape from courting groups to initiate a Discovery Ceremony (for a description of the Discovery Ceremony, see note at the end of this article).[1] The same apparently applies to the European nominate race, the Black-necked Grebe.

When following the courtship displays of Eared Grebes at two locations in Saskatchewan in the spring of 2008, I observed the birds engaging in flight beyond a mere pattering on the water surface, which did not appear to be intended to initiate a Discovery Ceremony. Here I describe the occurrences and interpret their meaning.

Observation Sites

Eared Grebes were observed on 24 May 2008 at a shallow body of water near Blaine Lake and on 25 and 27 May 2008 at Little Manitou Lake. Little Manitou Lake is an extremely saline lake of ca. 13 km² located at 51°44' N and 105°30' E, about 100 km southeast of Saskatoon. A population of about 53 Eared Grebes was observed for a total of 5 h from Range Road 250 cutting the eastern edge of the lake. The second observation site was on the Blaine Lakes west of the Town of Blaine Lakes at 52°49' N and 106°57' E.

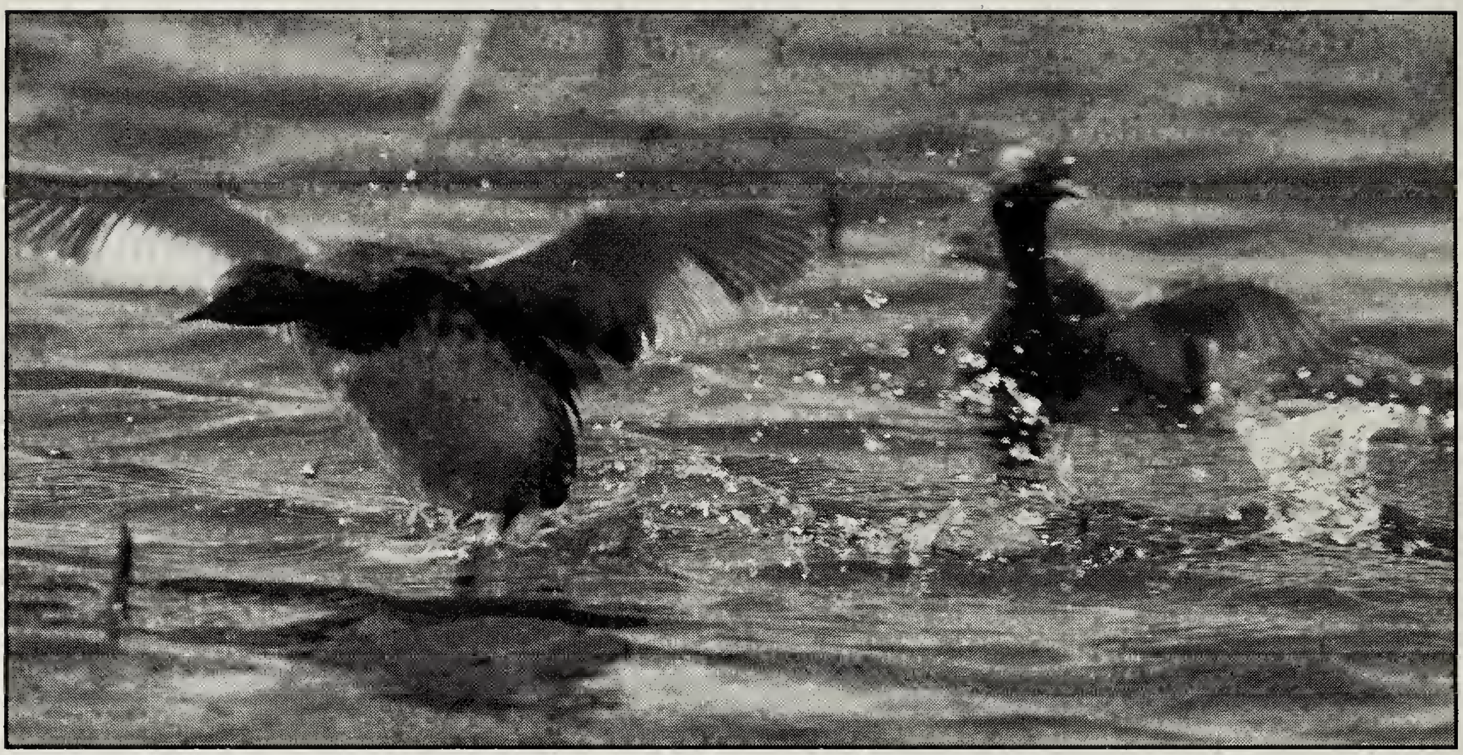

Figure 1. Take-off of a pair of Eared Grebes (near Blaine Lake). *André Konter*

There, the north basin of the Blaine Lakes is cut in two parts by Township Road 444, and about 66 Eared Grebes were present in the southern part (another 18 in the northern part) during the observations that lasted for about 7 h. All observations were conducted from Roads 250 and 444 with Zeiss binoculars (10×25) using the car as a blind, and photos were taken with a Minolta Dynax 7D camera and a Sigma AF 800-mm lens.

Observations Involving Flight

Blaine Lakes (north basin):

1] Three times two birds in a loose pairing took flight (Fig. 1), rising well above the water surface. They flew simultaneously in the same direction and landed after 20-40 m in areas with no or few conspecifics. They then simply drifted apart while preening and diving.

2] Twice a single Eared Grebe performed a similar flight retreating from a flock. In one case, “Advertising” followed, but did not seem to provoke a response.

3] Two Eared Grebes were swimming parallel to one another with no other conspecifics in their immediate vicinity, when both suddenly halted, lifted their necks, and took flight. They landed again after 15 m near emergent vegetation. Still close to one another, both lifted their necks straight up, stayed like this momentarily, and then lowered their necks again before swimming into vegetation, and out of sight.

4] Two grebes at the border of a group remained parallel for a while with their necks vertically raised, crests erect, and rotating slightly on the water surface. Suddenly, both took off, reached a maximum height of about 2 m, and landed after 30 m some distance from other grebes. While still 5 m apart, they started preening with no apparent courtship action following.

5] From two Eared Grebes at the edge of a loose group, and not readily identifiable as a pair, one suddenly became airborne, followed after a short hesitation by the second. They alighted about 2 m apart, raised their heads, and swam in parallel into the emergent vegetation, not moving closer to each other while doing so.

Little Manitou Lake:

1] Two Eared Grebes from a group

suddenly took flight. They reached a height of more than 1 m above the water surface. Both landed simultaneously after about 30 m in the same place and started preening. No other activity directly linked to courtship followed, but the pair was rather isolated from other conspecifics. Feeding and preening, they drifted slightly apart, came together again, and slowly swam back to rejoin the flock.

2] Two Eared Grebes flew off from a group, circled, and landed simultaneously after about 25 m of gliding. One individual adopted an "Inviting" posture on the open water surface, turning its back to the second bird. This second grebe swam close to the first, passing it slightly before stopping. Both turned parallel to one another, and the "Inviting" bird dove, followed immediately by the second.

3] Twice a pair of Eared Grebes was only noticed after take-off. Both times, the grebes landed at about the same place and no particular action followed.

4] Once, a single grebe became airborne. "Advertising" followed soon after landing, was repeated, and then the bird started swimming slowly back to where it originated.

5] One grebe (A) flew off escaping from a group of three (A, B, C), landing after about 30 m. Although this flight seemed lower than most others observed, the feet of the bird lost contact with the water surface for part of the distance. The two other birds (B and C) followed soon after. B landed close to A, and both engaged in a bout of head-shaking with heads kinked forward and low. Grebe C quickly swam towards the pair (A, B) and immediately dashed at A, driving it away. Grebe B did not intervene, but thereafter accepted the invitation for head-shaking by grebe C. This display was hardly started when it was interrupted by preening.

Possible Interpretations of Flight Actions

Excluding the isolated case where a single bird in flight was followed by two others, none of the take-offs can be seen as aimed at directly attacking another bird with a pattering flight low over the water. Indeed, no flights were directed at conspecifics. Except for a retreat apparently intended at initiating

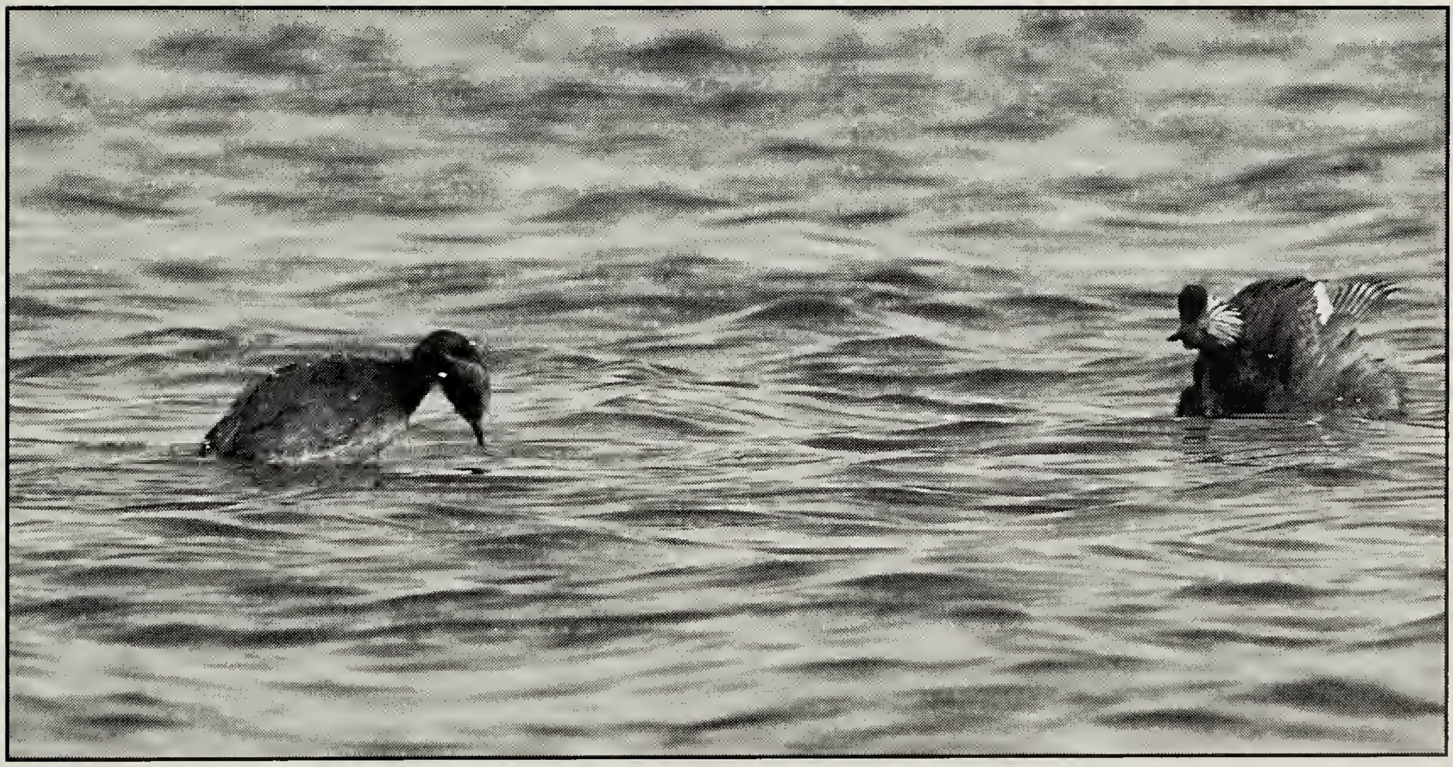

Figure 2. The Ghost-bird (left) goes fort the final dive while the Cat-bird (right) prepares for its surfacing (Discovery Ceremony, Little Manitou Lake). *André Konter*

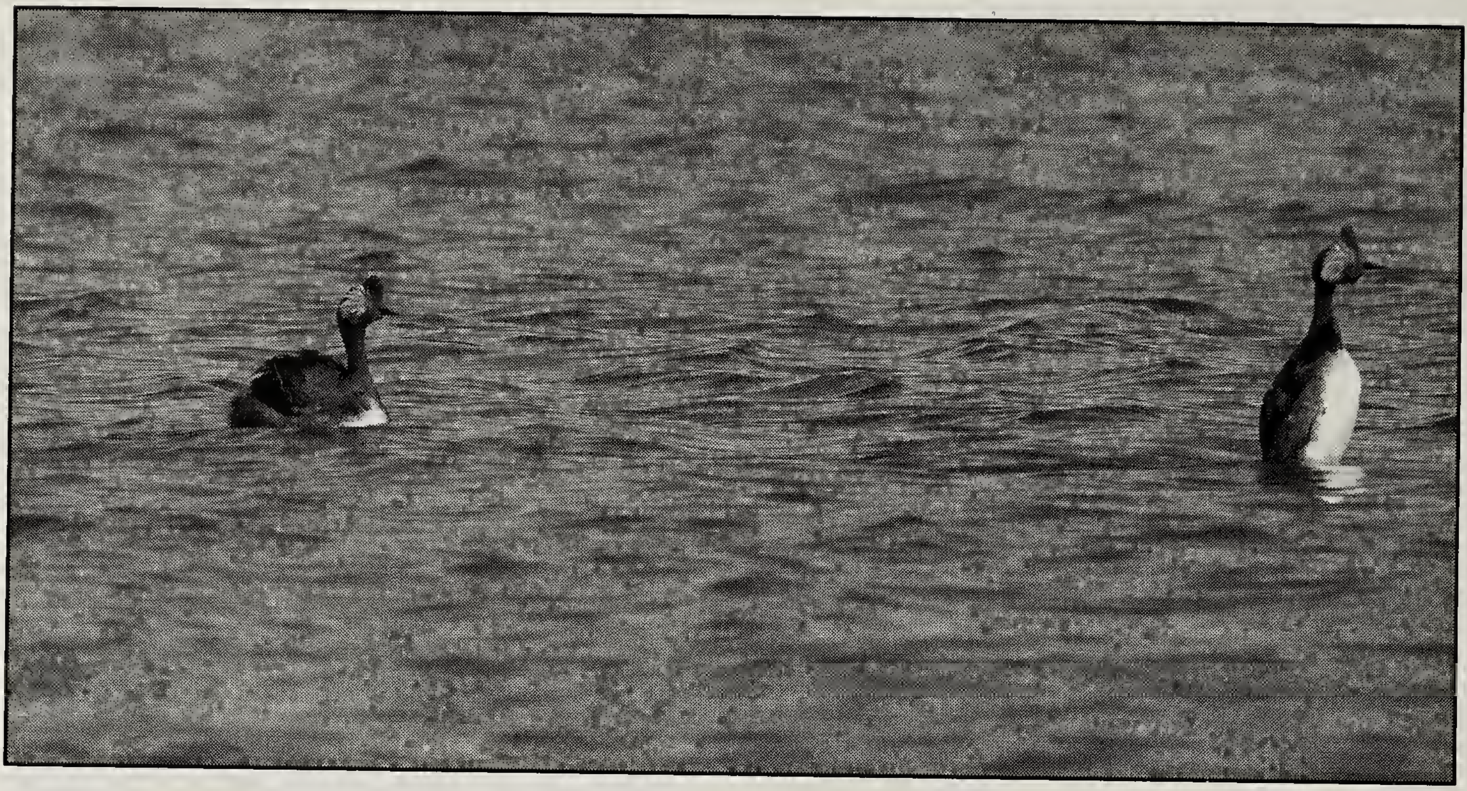

Figure 3. Final appearance of the Ghost-bird (right) in the Ghostly Penguin while the Cat-bird (left) already folds its wings away (Discovery Ceremony, Little Manitou Lake).
André Konter

a Discovery Ceremony, I could not find in the literature any mention of flight in the context of courtship in the North American Eared Grebe. Especially, no description of two birds becoming airborne simultaneously or involving a flight height where the feet are clearly off the water appears to exist. From a total of 14 flights observed in this study, only four were performed by single birds, and these could eventually be interpreted as a retreat for initiating a Discovery Ceremony (Figs. 2, 3), even though in one case the retreating bird was followed by two others. In no case did "Advertising" actually succeed in initiating any display. Also in no case did a single bird react to the "Advertising" calls of another grebe by flying to its mate as occasionally happens in Horned Grebes.[8]

For the nominate Black-necked Grebe, Prinzinger described what he termed "flight-racing", a display developing out of parallel swimming when two partners race with flapping wings, heads kinked forward, and feet performing footsteps on the water surface.[7] According to Fjeldså, "Splattering" that ends with a low flight of up to 50 m occurs in aggressive situations.[2] Prior, the birds swim together in a "Penguin-dance", then turn parallel and, after a short rush, start to flap wings to alight. The description broadly agrees with the "flight-racing" of Prinzinger, although there it exists as an independent courtship display away from aggressions.[7] Later authors no longer mention flight performances in the context of pair formation other than related to the Retreat Ceremony for the nominate.

In seven of the ten Saskatchewan cases where two grebes took flight, they flew away from a loose group of conspecifics, and in two cases it remained unclear where the pairs started. For all nine of these observations, the explanation suggested by Fjeldså may apply: the flights can be regarded as attempts to get away from potentially interfering neighbor birds to continue mutual displaying without disturbance.[2] However, after landing, only in one case "Inviting" on the open water surface occurred, whereas seven times no further courtship followed the flights and the birds simply preened or started food-diving. In another case, both grebes simply swam into emergent vegetation. Generally, in grebes, preening may be regarded as a display and is then termed Habit Preening. The action is very stereotyped and mostly no real preening occurs. In the Eared Grebe, preening is more difficult to interpret, and in fact no obvious differences seem to exist between real and ritualized preening. The evidence for Habit Preening in the species is largely contextual, for instance following or interrupting other displays. On this basis, some of the flights observed could represent a separate courtship display ending with Habit Preening. As two birds are involved, it could signal to others that their pair formation is well advanced. However, it cannot be completely excluded that two grebes may have taken off simultaneously by chance, both having the intention to start "Advertising" after landing, but refrained from doing so because they were not free from competition (two competitors moved together).

In the two cases where the paired birds alighted close to and disappeared into emergent vegetation, the action might be interpreted as a directed flight to a possible breeding site, similar to Parallel Swimming that may also be directed towards potential platform locations.

In only one case, it was clear that two grebes moved in isolation before taking flight. They did not appear to retreat from other rivaling conspecifics, and the common flight had a good chance of representing a true display.

It is also noteworthy that in contrast to a "Retreat flight" as described by Cullen et al.,[1] the grebes did not simply patter across the water (except during take-off and partially during landing), but all became airborne for at least part of their flight. At the breeding grounds during an initial phase, Eared Grebes appear less opposed to flight as is often believed. In a paper about behavior patterns, Fjeldså raised the question to what extent courtship behavior is adapted to the social organization.[2] In a competitive context, harsh aggression has seldom been reported in the gregarious Eared Grebes, and pursuit and attack appear more ritualized than in solitary breeders. Often no clear winner can be detected in their bouts of competition, and all grebes involved can stay rather close together afterwards, drifting apart only after some time. A pattering retreat flight might in such a situation be better suited to escape alone or in twos from a group and may have developed in time into an independent display.

Future Work

Except for retreating, most former indications involving flight in the context of pair formation have not survived in more recent publications. There is no doubt that other performances are more easily observed, either because they happen more frequently or because they are pre-announced by "Advertising". In the observation of even smaller populations of Eared Grebes, one needs a good deal of patience and luck to have focused on the right pair and to have registered its activity prior to its sudden take-off to get contextual evidence for the flights of either singles or pairs. More observations are needed, especially more observations on the pre-flight activity of the birds, to better understand what they really represent. Are they simply attempts to get away from potentially interfering neighbor birds to continue mutual displaying undisturbed as Fjeldså suggested for possibly all cases,[2] or could they be seen as separate pair-formation displays? Is there a particular signaling prior to the take-off that invites a partner to join in the flight? Under what circumstances do only single birds depart? These questions require extensive further investigation.

*A note on the Discovery Ceremony: A Discovery Ceremony is initiated by an advertising call of one grebe ("Ghost-bird") at some distance from a possible mate. The second bird ("Cat-bird") may reply to the call and turns towards the initiator, who thereupon starts diving in the direction of the mate. The mate on the surface partially lifts and unfolds its wings to assume the Cat-display (Fig. 2) and follows the progress of the Ghost-bird below the water. The latter may surface one or several times, either only displaying its head above the water surface or assuming a Hunched Posture before submerging again. In its final dive, it generally passes underneath the Cat-bird (who rotates) to grow out of the water in a Ghostly Penguin Display (Fig. 3) with its back turned towards the Cat-bird. The Ghost-bird swings to facing at maximum height and maintains the penguin posture by treading water. The Cat-bird abandons the Cat Display and raises into the penguin posture, too. Thus, both move towards one another to perform a penguin dance, breast to breast or, once together, to move parallel. The ceremony ends with Head Shaking and Habit Preening. At this moment, one partner may wish to engage in a second Discovery Ceremony. If so, it suddenly rushes over the water surface (Retreat Ceremony) to halt at some distance and adopts the Cat Display, whereupon its partner may submerge again.

Acknowledgements

I thank G. Laroche for assistance during field work and the reviewers for their most welcome suggestions to improve the initial manuscript.

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ARE BURROWING OWLS USING ENHANCED HABITAT?

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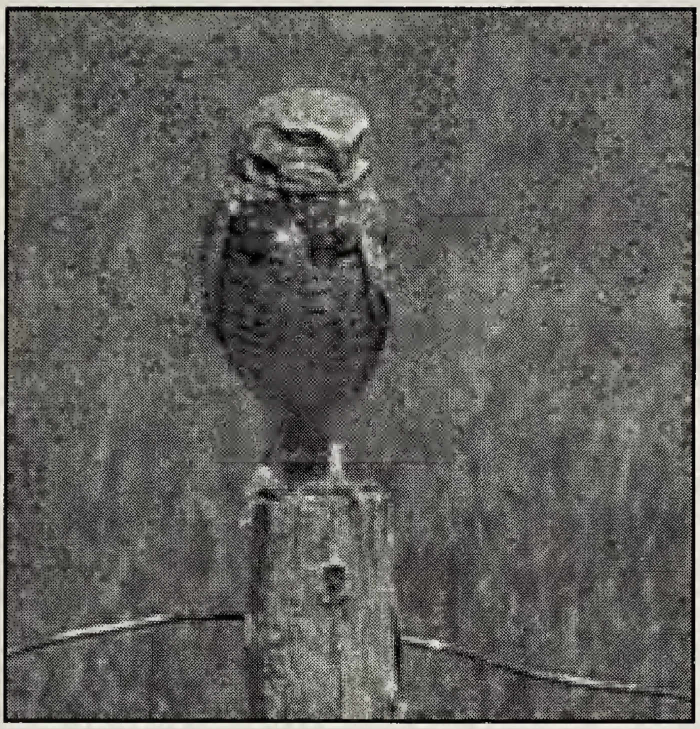

Burrowing owl perched on a fence post. This photo was taken in the summer of 2009, 1/4 mile east of McCord, SK. There were 4 owlets and the parents, one of which is shown here. On one occasion, one of the parents was seen chasing a badger across the road away from the nest. Gail Peterson

Through Operation Burrowing Owl (OBO), Nature Saskatchewan (NS) delivers a habitat enhancement program focusing on improving habitat for the endangered Burrowing Owl to aid in its recovery. Monitoring at OBO sites has indicated that the Saskatchewan Burrowing Owl population has declined by 92% from 1988 to 2009 (OBO database). Habitat is improved by enlarging pastures to increase grassland patch size and reduce habitat fragmentation. From 2000 to 2008, funding assistance was provided to landowners on a 50:50 cost share basis to seed cultivated land adjacent to existing grassland to perennial grass, with seven invasive tame species excluded from seed mixes (Smooth Bromegrass *[Bromus inermis]*, Crested Wheatgrass *[Agropyron* sp.*]*, Quack Grass *[A. repens]*, Kentucky Bluegrass *[Poa pratensis]*, Timothy *[Phleum pratense]*, Reed Canary grass *[Phalaris arundinacea]*, and Sweet Clover *[Melilotus alba]*). Project sites were required to be nearby (usually within 5 km) to pastures that supported Burrowing Owls within the past 20 years with priority given to sites that housed owls within the past 3 years, as verified by the OBO database. Each year, OBO landowners report the number of owl pairs and singles on their land, including those on the enhanced sites, through a mail-in census card or through being contacted by OBO. The National Burrowing Owl Recovery Team endorses habitat enhancement as an important recovery action on the breeding grounds.[1]

There was sufficient interest by rural landowners in the program from 2000 to 2006 to complete 85 projects that saw the conversion of 4849 ha (11,983 acres) of cropland to perennial grass. Each project is all or a portion of a quarter section (64.7 ha or 160 acres). When only a portion of a quarter section was converted, the remaining area usually was already pasture or hayland. In 2007, we examined the program to determine whether project sites or adjacent pastures were being used by Burrowing Owls and other prairie birds and mammals.

Site Selection

We selected habitat enhancement project sites based on age, location, and recent reports of owls in the area. Of the 57 project sites that were seeded from

2000 to 2004 and thus had been seeded for at least 2 years (allowing time for the grass to establish), 10 were selected. These 10 sites were chosen from among 16 project sites at least 2 years old and within the Regina Plain (K17) and adjacent Dirt Hills (M19) and Griffin Plain (K18) landscape areas; these areas tend to support higher owl numbers than other areas (OBO database). The remaining six project sites that met the age and location criteria had no recent owl activity and thus were excluded from the study due to limited resources.

The study was comprised of 28 quarter sections: 10 project sites along with 18 adjacent quarter sections with native or tame pasture or hayland. Adjacent pastures were surveyed, as owls may be using or attracted by the project site and may be nesting nearby. For three of the project sites, only a portion of the quarter section was in grassland. Adjacent quarter sections that were cultivated land (cropland or summer fallow) were not surveyed, as these were not suitable habitat, but the roadside habitat next to these areas was searched. For two sites, we were aware of owl activity in 2007 prior to our study, as these were reported by the landowner at one site and another researcher at the other (R. Poulin, Royal Saskatchewan Museum, pers. comm.) that was part of his Regina Plain study. When contacted to request permission to survey their land, the landowners of the 28 sites provided us with information on current ground cover (crop vs. pasture), presence of ground squirrels and/or badgers, and if they had seen Burrowing Owls on the quarter section in the current or previous years. Through these contacts, we were informed of owls currently on a quarter section adjacent to a habitat enhancement project site.

Survey Methodology

Four NS staff worked in pairs to conduct surveys on foot in intervals of 100 m, observing 50 m on each side of the surveyor. On occasion, surveys deviated from a straight line to ensure thorough coverage of the most suitable habitat, including areas with badger or ground squirrel burrow presence. Areas of unsuitable owl habitat (vegetation higher than 75 cm and extremely dense) were not surveyed. For each site, the surveyor recorded GPS coordinates of detections (by sight or sound) of Burrowing Owls, nine other grassland bird species, badger or ground squirrel holes by abundance category (category 1: one hole per cluster, category 2: two to four holes per cluster and category 3: more than five holes per cluster) as these are potential nest sites for Burrowing Owls, and all temporary or permanent wetlands.

Surveys were conducted from 25 June to 10 July 2007, when owls and their broods were most visible due to young owls around nest entrances and there was increased activity from fledglings learning to hunt and fly.[2] Failed nests may have been missed during these surveys. Surveyors looked for signs of an active burrow (nest site): a well-trampled mound outside the burrow; a burrow entrance that is scattered with owl pellets, bones, and/or insect parts; shredded manure in and whitewash (owl excrement) surrounding the burrow entrance; and the presence of Burrowing Owls. Sites with nesting owls were revisited from 23 July to 3 August to identify nests that successfully fledged young as indicated by their presence near the nest hole.

Results and Discussion

As considerable effort has gone into habitat enhancement for Burrowing Owls since 2000, we investigated whether there was evidence of owl use of project sites by checking the most likely project sites that owls might be using. Our study provides evidence that owls will use project sites or may be attracted to areas adjacent to these, and that it may be a number of years before this occurs.

We observed a total of five pairs (all nests fledged young) and 11 single Burrowing Owls on six of the 28 quarter sections that comprised the study. Of the 10 quarter sections with project sites, owls were found nesting on three. However, only one of the three quarter sections had owls nesting on the project site, and the other two had owls nesting on the native grass portion of the quarter section. The project site with nesting owls included one pair and two single young (140 acres seeded to grassland: 40 acres in 2000, 75 acres in 2001, and 25 acres in 2003). Of the two quarter sections with nesting owls on the native grass portion, one had two nesting pairs and four single owls (15 acres seeded in 2000; not a full quarter in grassland), and the other had one adult (200 acres seeded in 2000).

Burrowing Owls were found on three of the 18 quarter sections adjacent to project site quarter sections. One of these (mixed grassland) supported one pair and one single adult. The other two were adjacent to the same project site quarter section, with one (native grass) supporting one pair and a single adult and the other (a stubble field, surveyed as it had not been seeded) with two single adults.

Of the 28 quarter sections in the study, three had many more clusters (>40 clusters) of ground squirrel holes in category 3 (>5 holes in the cluster) than the others (with <15 clusters). The three quarter sections with many holes supported one to two pairs of nesting owls, including the project site with one pair of owls. The fourth quarter section with nesting owls had fewer holes (six clusters in category 3), similar to quarter sections with no owls. Sixteen of the 28 quarter sections had only smaller clusters of holes and no clusters in category 3, including four of the 10 project sites. These results reaffirm the need for sufficient numbers of burrows and burrowing mammals for owl occupancy of grassland habitat.[3]

Burrowing Owls were located on or adjacent to five of the 10 project sites, and were more often found on those with better established ground squirrel populations. The landowners of 24 of the 28 quarter sections in the study did not recall seeing owls prior to the enhancement projects, suggesting that at least some owls may have been there as a result of the project site providing or enhancing habitat. On the remaining four quarter sections, two with a project site had nesting owls every year on the native grass portion, and no information was available for two that were adjacent to project sites.

In addition, eight of the nine grassland bird species selected as representative species were found on quarter sections with project sites: Western Meadowlark (eight sites), Savannah Sparrow (seven sites), Horned Lark (five sites), Baird's Sparrow (four sites), Vesper Sparrow (three sites), Bobolink (three sites), Clay-coloured Sparrow (two sites), and Sprague's Pipit (two sites). Loggerhead Shrikes were not found at any sites, although one individual was recorded on an adjacent quarter section. The 10 quarter sections with project sites were used to varying degrees with each site used by at least one of the nine grassland bird species and four sites used by five species.

In 2008 and 2009, the annual OBO census indicated further encouraging results, bringing the number of project sites used by nesting owls to five. Of the 120 projects (6173 ha or 15,254 acres seeded) that have been completed through

NS across southern Saskatchewan from 2000 to 2008, Burrowing Owls were reported nesting on ten quarter sections with project sites (including on five project sites) in at least one year between 2007 and 2009; no owls were reported prior to 2007. Single owls were reported on an additional three project site quarter sections.

In 2007, a nesting pair of owls was first reported on a project site (as noted above); in 2008 and 2009, no owls returned to the project site but two and three pairs, respectively, nested on the native portion of this quarter. In 2008, nesting pairs were reported on two different project sites: two pairs on a site seeded in 2000 (a single owl in 2007 and one pair in 2009), and one pair on a site seeded in 2005. In addition, a single owl was reported on a third project site. In 2009, nesting pairs were reported on three project sites: one pair on a site seeded in 2000 (same site with a single owl in 2007 and two pairs in 2008; in 2009 there were also two additional pairs on the native portion of this quarter section), one pair on a site seeded in 2006, and one pair on a site seeded in 2008. In addition, a single owl was reported on a fourth project site.

These results provide encouragement that enhanced sites will be used by owls as the sites become established. Given time for this to occur, further and more rigorous study of enhancement projects may reveal their importance in the recovery of the Saskatchewan Burrowing Owl population.

Acknowledgements

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CORRECTION: In the September 2009 issue of Blue Jay, p. 147, the top photo shows Cliff Wallis with Bill and Natalia Labatiuk.

AMPHIBIANS

AN EXTENSION OF GRAY TREEFROG RANGE IN MANITOBA AND INTO SASKATCHEWAN

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This is an unplanned sequel to an earlier article on Gray Treefrog distribution in west-central Manitoba, mostly in the northern Interlake region.[4] Except for mentioning two previous specimen records near Cowan and Camperville, and a few speculative comments about areas adjoining Duck Mountain and the Porcupine Hills, that article did not cover the region west of Lake Winnipegosis. Shortly after it was published, however, Gray Treefrogs were reported calling near Pelican Rapids, Manitoba, in 1997 (Ron Hooper, pers. comm.). Pelican Rapids is at the south-eastern corner of Dawson Bay, which is the most northwesterly arm of Lake Winnipegosis (see Fig.1). In addition, there are two unconfirmed treefrog reports for Saskatchewan: one heard near Fort Qu'Appelle in 2007, and one that was reported as caught at Katepwa but neither kept nor photographed (Ron Hooper, pers. comm.).

Gray Treefrogs call at breeding pools on warm evenings, often starting around 6:00 p.m. and continuing until 11:00 p.m. or later. In the Pinawa area of southeastern Manitoba (50° N, 96° W), individuals have been heard calling from 30 April to 6 September, with full choruses from 11 May to 5 July (these dates include the year-to-year variation between 1989 and 2005).[3] The species has been heard in the northern Interlake region (north of 52° N) as early as 19 May, and the peak calling period there appears to be the second half of June, with some calling into early July at least.[2, 4] Favoured breeding localities include borrow pits, ditches, and beaver swamps in forested areas, often adjoining highways, as well as natural, permanent wetlands in forested regions. Under good weather conditions at the right time of year, it is therefore possible to survey large areas for Gray Treefrogs in a few hours of road travel with frequent stops. In this way, I explored the limits of the species' range west of Lake Winnipegosis, with particular interest in determining whether the range extends into Saskatchewan.

Survey Summaries

I was fortunate to have good conditions (temperatures near 20°C with light winds and fairly high humidity but little or no precipitation) to conduct roadside surveys in several areas west of Lake Winnipegosis on one evening in June 2008 and three in June 2009. The areas surveyed, and the locations where Gray Treefrogs were heard, are mapped in Fig. 1, which corresponds roughly to the western half of Fig. 1 in Reference 4. The two lightly shaded, polygonal areas show the combined Manitoba and Saskatchewan provincial parks and provincial forests in the Duck Mountain and Porcupine Hills regions. Individual locations are identified on the map by a one- or two-letter code, and in the text by the same code in square brackets. Some

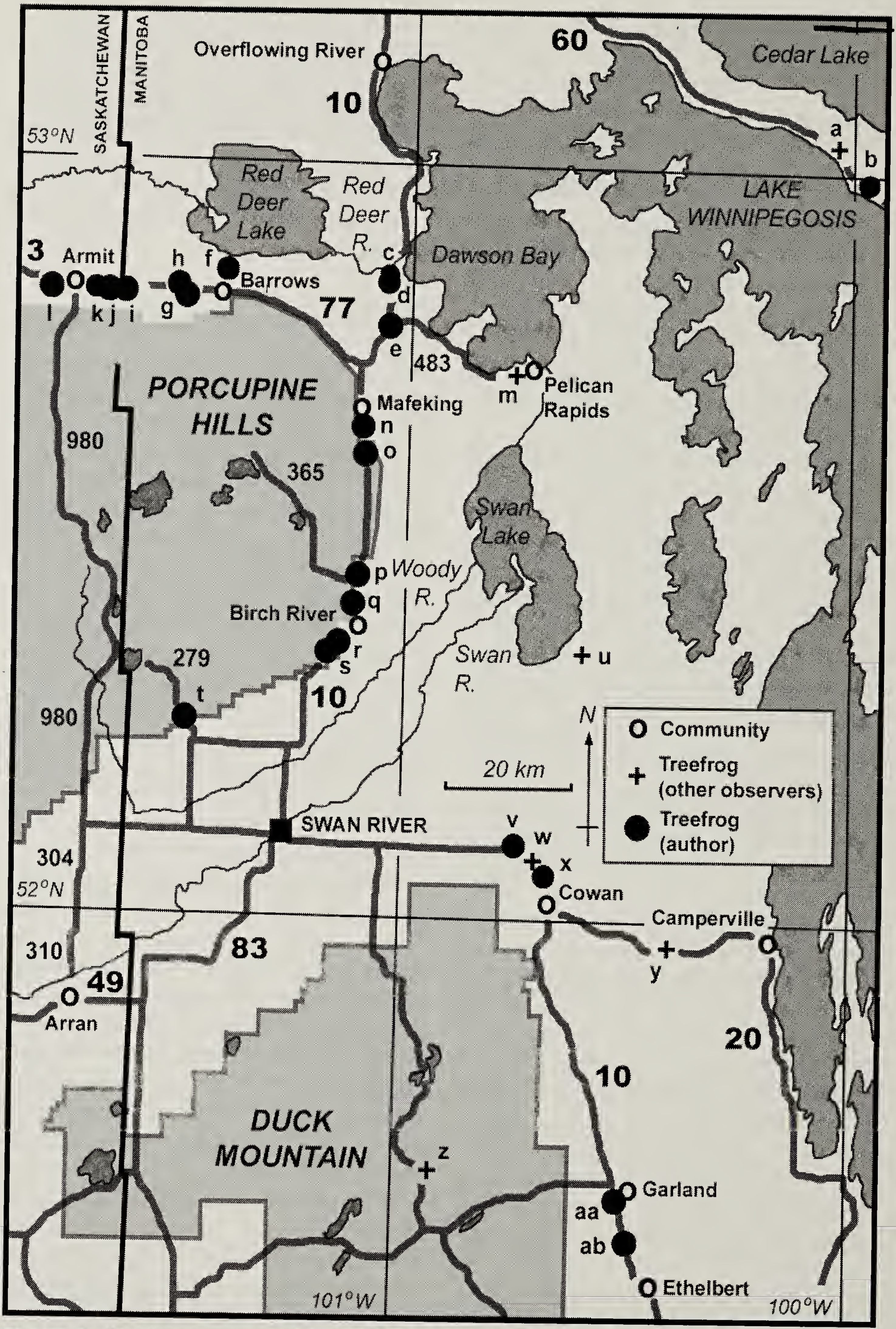

Figure 1. Study area west of Lake Winnipegosis showing records of Gray Treefrogs in Manitoba and Saskatchewan.

multiple locations within 1 km of one another are represented by a single point, unless they are discussed separately in the text.

Day 1, 23 June 2008

While travelling south on Manitoba Highway (Hwy) 10, I detected Gray Treefrogs at a borrow pit on the west side of Hwy 10 [c], 2.2 km south of the Red Deer River bridge and 23 km north of Mafeking (according to a nearby road sign; other distances were measured by odometer). About six were calling strongly here at 6:15 p.m.; at least four were calling at a roadside pool about 0.5 km farther south [d], and one more was heard at a backed-up culvert 0.9 km south of the junction of Provincial Road (PR) 483 to Pelican Rapids [e].

I then travelled west on Hwy 77 from Hwy 10 to the Saskatchewan border, with a brief side-trip northward from Barrows to the south shore of Red Deer Lake, then continued on Saskatchewan Hwy 3 for about 8 km to Armit. The eastern half of Hwy 77 was disappointing, with no treefrogs heard in swampy areas at 0.7 and 3.8 km from Hwy 10, after which the habitat was less promising, with heavily wooded but generally rolling and well-drained terrain. I had better luck near Barrows, with one treefrog calling at a farm dugout 3.3 km north on the Red Deer Lake road [f], then two calling at 7.2 km and two at 7.9 km west along Hwy 77 [g,h]. Finally, between 8:00 and 9:00 p.m., I detected two calling softly in roadside trees alongside Hwy 3, about 1.1 and 1.3 km west of the Saskatchewan welcoming sign [j]. The soft calling, away from water, suggested that they were not breeding that evening.

Around 10:15 to 10:30 p.m., I made several brief stops along Hwy 10 where it skirts the eastern edge of Porcupine Provincial Forest. Treefrogs were heard between 1.3 km north [p] and 2.4 km south [q] of the junction of PR 365 (Steeprock Lake road), and again between 9.8 and 11.5 km south of that junction [r,s], southwest of the community of Birch River. The treefrogs appeared to be generally distributed in areas of wet, level terrain with immature stands of aspen and willow or mixed-wood forest.

Day 2, 24 June 2009

Between 5:45 p.m. and about 8:00 p.m., I slowly drove about 25 km north from the 0 km sign at the south end of Saskatchewan Hwy 980, and back, without hearing any treefrogs. The most promising habitat (slow-flowing creeks and beaver swamps) was near the south end of this road and the adjoining few kilometres of Range Road 304, where numerous small tributaries of the Woody River originate. Farther north into the hills, there was little standing water in the rolling terrain.

I backtracked into Manitoba and explored side roads northwest of Swan River. Again there seemed to be suitable spots near some creeks, but much of the habitat was fragmented by extensive cropland. The only Gray Treefrogs I heard that evening were one or two individuals calling at a beaver swamp just inside Porcupine Provincial Forest along PR 279 (the Whitefish Lake road) at 52.262° N, 101.476° W [t]. This is the most westerly treefrog location that I have found on the south side of the Porcupine Hills.

Day 3, 25 June 2009

While travelling from Pinawa to Swan River, I made several quick stops between 7:00 and 8:00 p.m. along Hwy 10 north of Ethelbert and due east of Duck Mountain. Gray Treefrogs were calling between Fork River and Garland River, about 8 and 14 km north of Ethelbert [aa, ab], but none was heard between Garland and Cowan. More were calling, however, at several locations between 6 and 9 km northwest of Cowan [x,v]; this area corresponds to one of F.R. Cook's two specimen locations [w], the other being midway between Cowan and Camperville [y].[2, 4]

I revisited the southernmost few kilometres of Saskatchewan Hwy 980 (see Day 2, above) at about 9 p.m., then explored Range Roads 304 and 310 south to Arran, and Hwy 49 east to the Manitoba border, before returning to Swan River without further stops. No treefrogs were heard, and areas of seemingly suitable habitat were again relatively fragmented.

Day 4, 26 June 2009

I revisited some of the areas surveyed on Day 1 (see above), hoping to obtain sound recordings of Gray Treefrogs near the Manitoba-Saskatchewan border.

Travelling north from Swan River on Hwy 10, I noted treefrogs at about 6:00 p.m. near Birch River (52.372° N, 101.146° W, close to the southernmost record on Day 1 [s]), then at two locations [o,n] south of Mafeking (52.621° N, 101.096° W and 52.670° N, 101.097° W). I obtained a sound recording of a small breeding chorus (about three calling individuals) at the latter location, 1.4 km south of the Mafeking town-limit sign.

Heading west on Hwy 77, I recorded another small chorus at one of the Day 1 locations [g], about 7.2 km west of Barrows (52.830° N, 101.548° W). The treefrogs were calling strongly and were audible from about 800 m along the highway. Farther west, a single treefrog was calling a few hundred metres east of the Saskatchewan border [i].

At 52.830° N, 101.700° W, about 1.9 km west of the "Saskatchewan Naturally" sign, about four treefrogs were calling in a breeding chorus at about 8:30 p.m., and I was able to obtain satisfactory sound recordings [j]. The habitat was a dense strip of willows on the south side of the highway, with standing water in the ditch, in mostly coniferous (spruce and tamarack) forest.

About 4 km farther west (1.4 km east of the junction of Saskatchewan Hwy 3 and Hwy 980), at 52.834° N, 101.759° W, three treefrogs were calling at a beaver swamp that was partly retained by the old Canadian National Railway right-of-way, immediately south of and parallel to the highway [k]. At this point, there is farmland to the northeast but continuous forest in the other three quadrants. A photograph of the habitat is shown in Fig. 2. Again, sound recordings were obtained. The treefrogs were still calling when I revisited the area at 10:40 p.m.

Finally, a single treefrog was heard in an extensive swampy area south of Hwy 3 west of Armit at 52.834° N, 101.816° W (my location on the highway), between the Little Armit and North Armit river crossings [l]; it was too far away to obtain sound recordings. No more treefrogs were found, although there appeared to be suitable habitat in places, between 9:30 and 10:30 p.m. along Hwy 3 west to the Red Deer River crossing near Erwood. A side-trip down the northernmost 7 km of Hwy 980 was also fruitless.

Additional Records

I received the following reports of Gray Treefrogs at previously unpublished localities in western Manitoba:

(a) One noted by Dauphin naturalist Bill Walley in the Chain Lakes area of Duck Mountain Provincial Park, 1 July 2008. The approximate location is indicated in Fig. 1 [z].

(b) Single individuals seen at 52.328° N, 100.616° W (near Kettle Stones Provincial Park, just south of Swan Lake), 7 July 2009 [u], and both seen and heard at 52.739° N, 100.715° W

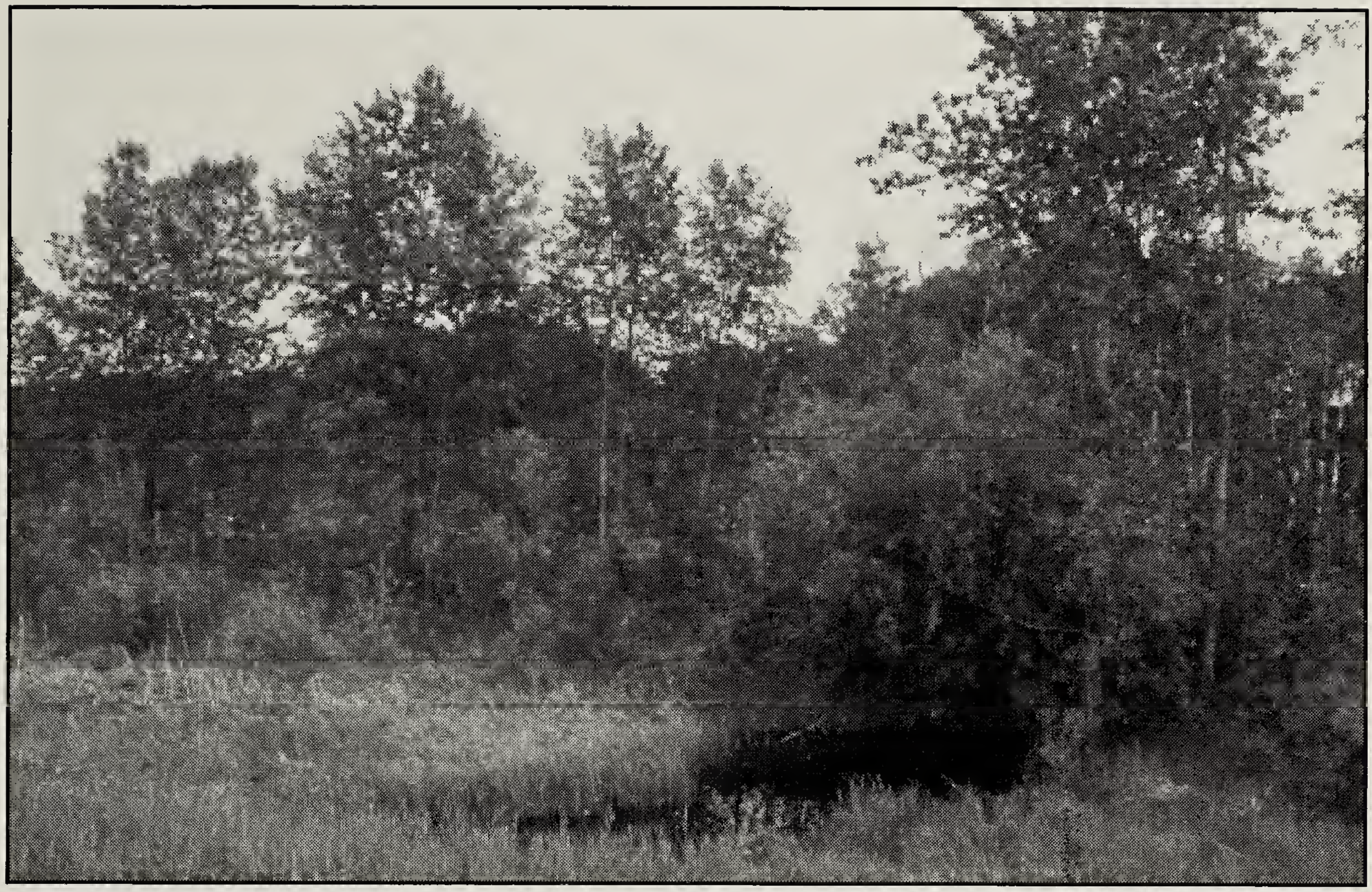

Figure 2. Gray Treefrog habitat alongside Saskatchewan Highway 3 east of Armit.
Peter Taylor

(near Pelican Rapids), 8 July 2009 [m], by Winnipeg-based naturalist Christian Artuso. Both locations are included in Fig. 1. The Pelican Rapids location is close to Ron Hooper's 1997 record, but exact coordinates for the latter are not known.

The occurrence of Gray Treefrogs along Hwy 60 north of Lake Winnipegosis, as described previously,[4] was confirmed by Jim Duncan (manager of the Manitoba Conservation Data Centre), who noted one calling at 53.033° N, 100.055° W on the morning of 12 June 2009 [a]. This is about 8 km beyond the previous "farthest west" record on Hwy 60 at 52.987° N, 99.968° W [b].[4]

Similarly, the presence of Gray Treefrogs along Hwy 6 south of Grand Rapids, as well as the easternmost portion of Hwy 60 (as described and mapped in Reference 4), was confirmed by Randy Mooi (Curator of Zoology at The Manitoba Museum, Winnipeg) in late June 2008 and 2009. His records extend the "farthest north" on Hwy 6 by about 7 km, from 53.060° N, 99.225° W [ac] to 53.120° N, 99.254° W [ad]. The latter location was documented by a voucher specimen (MM933) in the Manitoba Museum collection, collected by Mooi on 23 June 2008 and shown in Fig. 3 (see inside back cover, top). Several individuals were also calling there on 26 June 2009. These localities [a, b, ac, ad] are mapped in Fig. 4, which is adapted from Fig. 1 of Reference 4 and includes a small area of overlap with Fig. 1. Note that locality [ac] was previously discussed in Reference 4 but overlooked when the original map was prepared.

Well within the known range limits, but filling gaps in the mapped distribution of records,[1] I heard Gray Treefrogs calling during the early evening of 10 June 2009 at numerous locations along a 50-km stretch of Hwy 6 in the Camper–Ashern–Grahamdale–Hilbre area (between about 51.1° N, 98.3° W and 51.5° N, 98.6° W). The following day, 11 June 2009, they

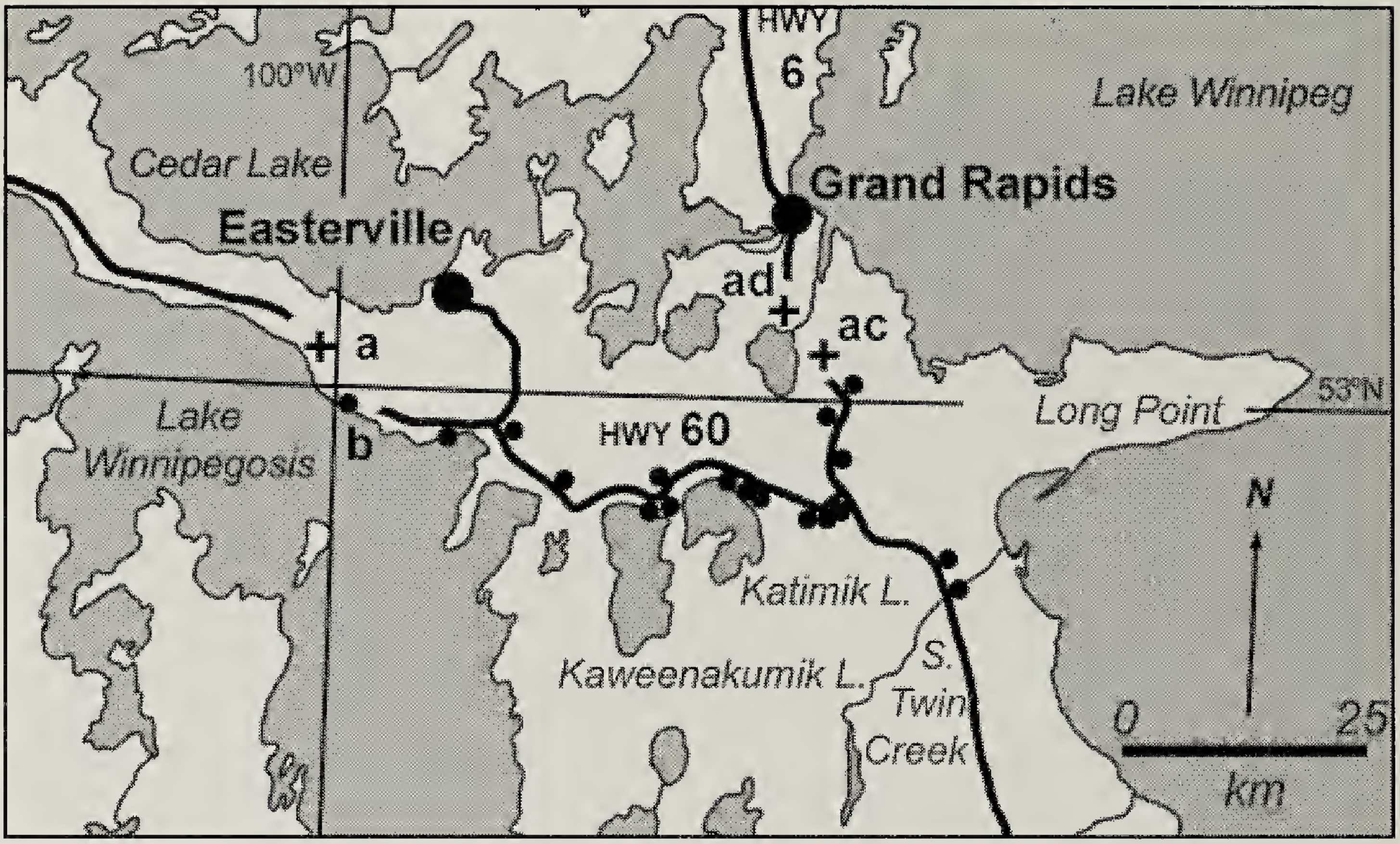

Figure 4. Northernmost records for Gray Treefrogs near Grand Rapids, Manitoba. Dots indicate previously mapped localities; "+" indicates new and previously unmapped localities.

were widespread along PR 513 between Gypsumville and the community of Dauphin River, on the western shore of Lake Winnipeg. They were especially numerous near the forested edges of the immense grassy marshes bordering the Dauphin River itself (about 51.9° N, 98.3° W), due north of the northern extremity of Lake St. Martin, but were relatively scarce farther east.

Discussion

This article documents an extension of the Gray Treefrog's known range northward to the fringes of the Porcupine Hills, and west as far as the Armit area of Saskatchewan. The species is quite widely distributed in low-lying areas near the eastern fringes of Duck Mountain and the Porcupine Hills, and there is one report from the heart of Duck Mountain (Fig. 1). South of the Porcupine Hills, the treefrogs seem to disappear just east of the Saskatchewan border. It is possible, however, that they occur in more southerly areas of eastern Saskatchewan, for example in the western part of the Duck Mountain region or in the Qu'Appelle Valley.

The sound recordings made at two Saskatchewan locations [j,k] on 26 June 2009 were sent to the Royal Saskatchewan Museum, and those from Manitoba and Saskatchewan locations [g,j,k,n] were sent to the Manitoba Museum. Curators at both museums confirmed the identity of the sounds, which appear to provide the first substantive evidence of Gray Treefrogs in Saskatchewan, as well as in the Porcupine Hills region of Manitoba (R. Poulin and R. Mooi, pers. comm.).

The treefrogs show an affinity for regions of level, forested terrain where the water table is at or near the surface, and where potential breeding pools are created by both natural perturbations (e.g., beaver activity) and human activities (e.g., dug-out ponds, borrow pits, and drainage modification by rights-of-way).

They appear to prefer more or less continuous forest, although in areas with large treefrog populations (such as my home area near Pinawa in southeastern Manitoba), some individuals may wander along ditches or through wetlands for a kilometre or more from forested areas.

Factors limiting the Gray Treefrog's range may include decreasing moisture to the west and south, and decreasing temperature to the north. Habitat fragmentation by agricultural development may limit treefrog distribution at the western fringe of the range, based on their apparent absence from much of the Swan River valley. It remains to be seen whether the range completely encircles Lake Winnipegosis, or whether the combination of glacial moraines and spruce bogs at the northern extremity of the lake comprise an effective barrier, as suggested previously.[4] There appears to be suitable habitat near Manitoba Hwy 10 north of the Red Deer River, at least as far as Overflowing River.

While Gray Treefrogs show some preference for deciduous cover, the deciduous component at some localities was limited to young willows or aspens in disturbed areas of predominantly coniferous forest. The breeding localities along Hwy 10 south of the Red Deer River [c,d] were situated in a large expanse of burned coniferous forest in the early stages of regeneration, where deciduous growth was limited to aspen and willow saplings plus a few small, surviving aspens.

As with many range extensions in sparsely populated regions, it is unknown whether the records described here represent an actual expansion of the population, the discovery of a long-standing population, or a sporadic fluctuation. Only further observations over a long period of time can resolve this uncertainty.

Acknowledgements

I thank Christian Artuso, Jim Duncan, Ron Hooper, Randy Mooi, and Bill Walley for the observations cited in this article, and Randy Mooi for permission to use his photograph of a treefrog.

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* * *

The least movement is of importance to all nature.
The entire ocean is affected by a pebble.

- Blaise Pascal

SPECIES DIVERSITY OF DRAGONFLIES AND DAMSELFLIES (ODONATA) AT A MANITOBA POND

MARJORIE HUGHES, 1102-430 Webb Place, Winnipeg, MB, R3B 3J7; E-mail: <hughes_marjorie@hotmail.com>

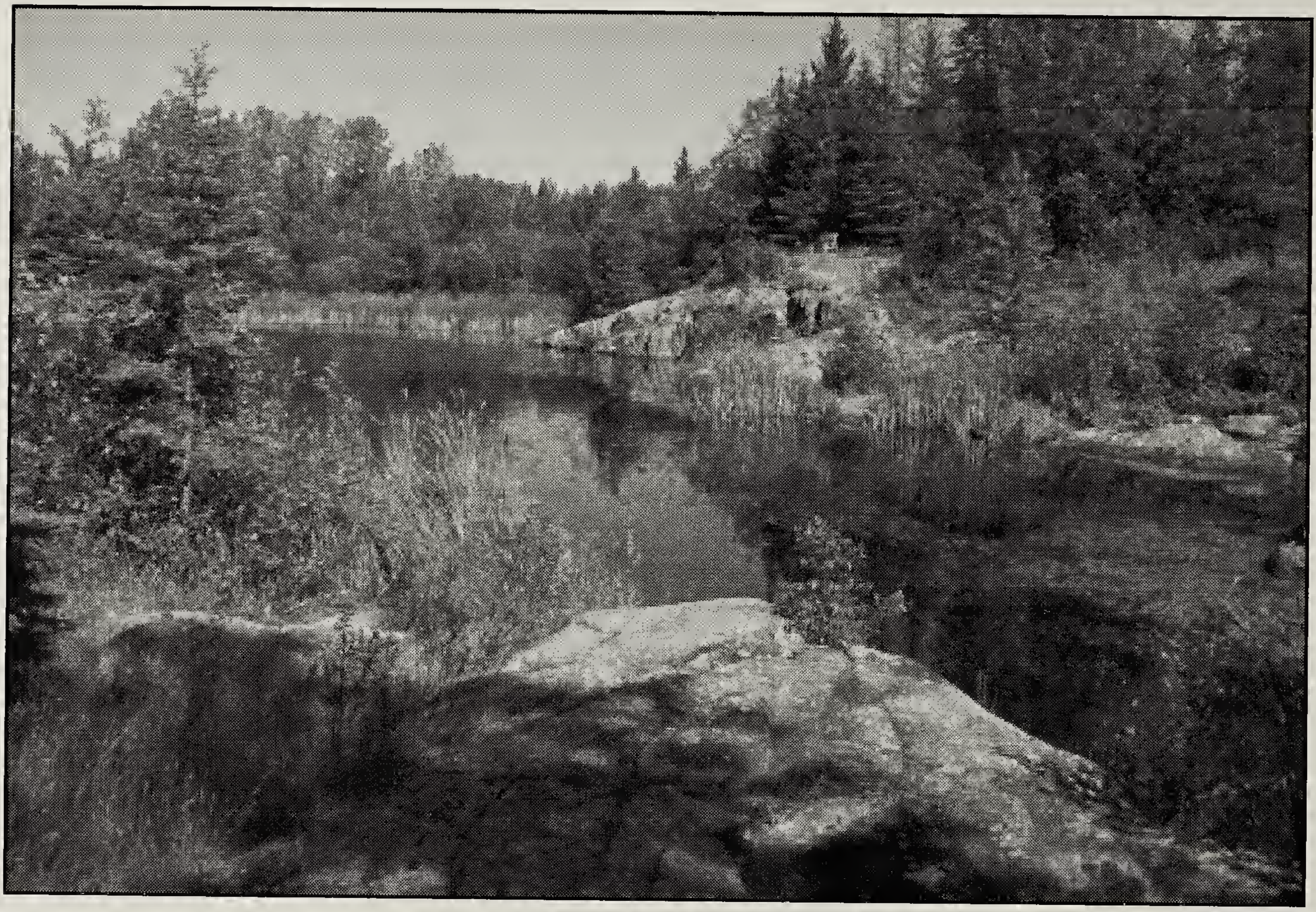

Figure 1. A view of the study site, a pond 2 km northwest of Pinawa, MB.
Marjorie Hughes

Periodically the scientific community requests the help of volunteers to study dragonflies and damselflies (order Odonata). This survey was completed between June and September 2008 to assist with a study on the temporal design of site-based odonate surveys being carried out by the Nature Conservancy office in Albany, New York.[2] The purpose of that study was to determine how often surveys should be conducted and how long they should last to obtain the most accurate data for the minimum amount of time and effort.[1] From my perspective, the survey of the Manitoba pond described here resulted in a list of Odonata species, their flight phenology, and their relative abundance.

Study Area

Volunteers were asked to select a man-made or naturally occurring wetland, lake, or pond (lentic water bodies only) close to their home or work. For this study, I chose

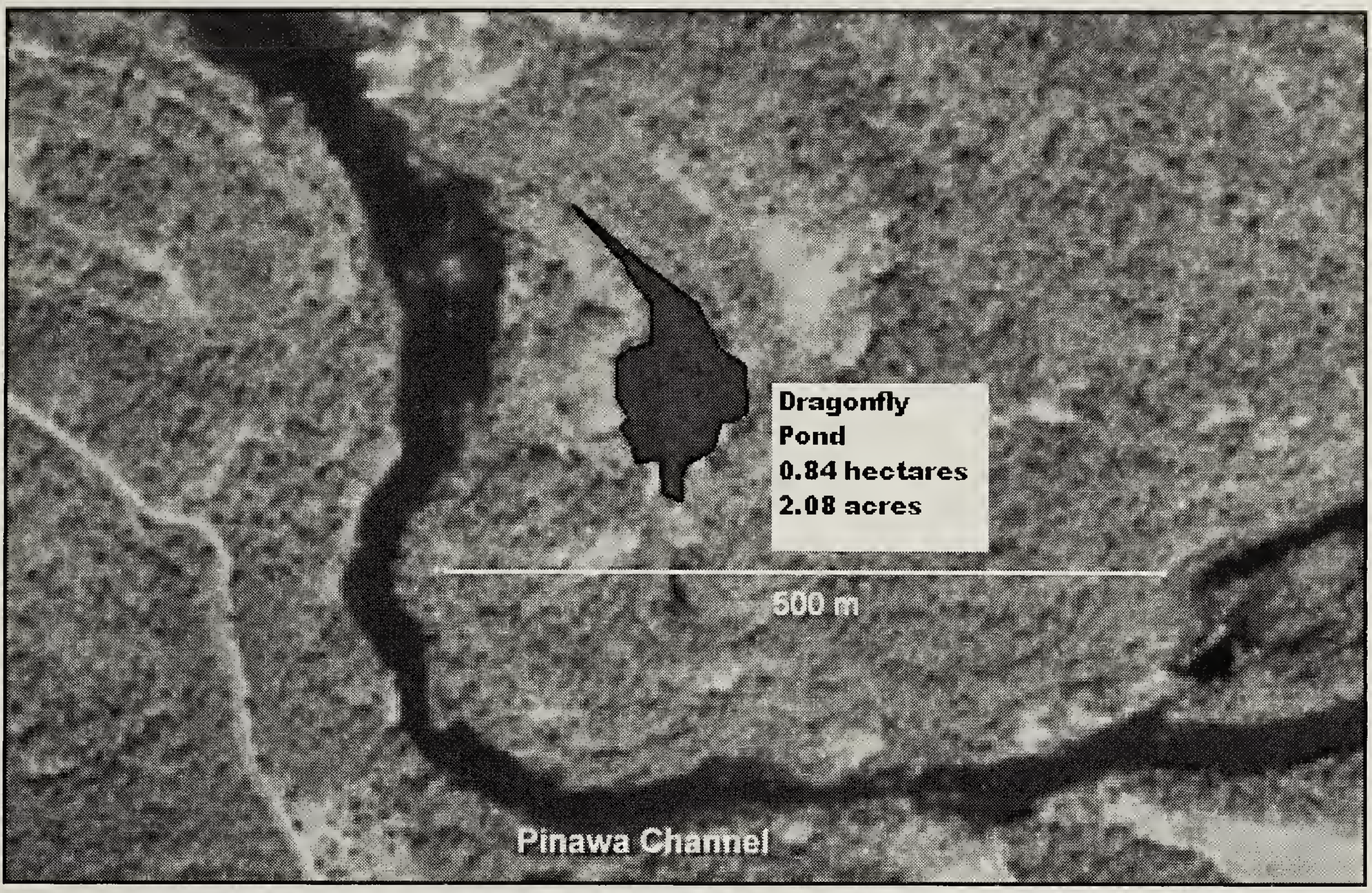

Figure 2. Map of the study site, a pond 2 km northwest of the town of Pinawa, MB.

a pond adjacent to the Pinawa Channel, about 2 km northwest of the town of Pinawa, Manitoba (50° 09.557' N, 95° 54.147' W). This 0.84 hectare pond, which has no official name, is a picturesque spot with exposed Precambrian Shield granite on one shore and marsh on the other, and there is no road access (Figs. 1 and 2). The pond is only accessible at the south-east shore where the substrate is exposed granite rock. The vegetation is typical of the Boreal Shield Ecozone: Balsam Fir *(Abies balsamea)*, White Spruce *(Picea glauca)*, poplars *(Populus* spp.*)*, and birches *(Betula* spp.*)*. The marshy areas have cattails and bulrushes or ostrich ferns. The pond is home to a large population of small fishes, Painted Turtles, and Leopard Frogs, which likely consume many odonates. Beavers have been observed in the pond and may be responsible for its existence.

Methods

I used the following methods for this survey, as directed by the study coordinator. A single observer (the same each time) visited the pond once a week for 20 or more surveys spaced 7 ± 2 days apart. Surveys were only conducted on sunny days with less than 50% cloud cover, when maximum temperatures were expected to reach at least 18.3°C in May and September and 21.1°C in June to August. The observer walked around the pond for 1 hour and recorded dragonfly species sightings in 10-minute increments (0-10, 10-20, 20-30, 30-40, 40-50, 50-60). The observer noted whether the dragonflies were male or female and whether indicators of breeding were observed, such as the presence of immatures, guarding behaviour, copulation, or oviposition. The abundance of each species was estimated on a scale of 1 to 4, where 1 = Few (1-5 individuals), 2 = Frequent (6-20), 3 = Common (21-100), and 4 = Abundant (>100). Every week the same route was surveyed in an identical manner at the same time of day. My route took me from the edge of the marshy areas, along the rocky shore, and also high above the pond on rocky outcrops where odonates were sunning themselves and hunting. Basic weather observations were also recorded.

Where there was uncertainty of identification, I recorded this on data sheets. Time-outs were used during 1-hour survey blocks to allow for catch-identify-release of dragonflies. Difficult groups for identification were treated as a species complex. The species list in Table 1 shows three species complexes at my study site: *Aeshna canadensis-umbrosa-interrupta-eremita, Lestes disjunctus-forcipatus,* and four species of *Enallagma* (it was quite easy to distinguish *E. carunculatum* because of its size). Although a specimen from a species complex could be identified in hand, the purpose of this study was distance observation, which precluded the capture of every individual.

One or two mature specimens of all species were collected, treated with acetone where necessary, dried, and placed in clear envelopes with index card labels. They have been deposited in the J.B. Wallis insect collection at the University of Manitoba.

Results

Thirty-six species of Odonata (23 dragonflies [Anisoptera] and 13 damselflies [Zygoptera]) were found in the vicinity of the study pond in 2008 (Table 1). Another four species have been found on other occasions: a Springtime Darner *(Basiaeschna janata)* on 13 June 2007, and a Lancet Clubtail *(Gomphus exilis)*, a Pronghorn Clubtail *(G. graslinellus)*, and a Williamson's Emerald *(Somatochlora williamsoni)* all collected on 2 August 2009. The total number of recorded species for the province of Manitoba is approximately 97.[3]

Because it was a cool spring, the first acceptable observation day was 5 June. Already the Boreal and Northern Bluets *(Enallagma boreale* and *E. cyathigerum)* were quite common floating among the cattails and forming mating wheels. There were several types of Whiteface dragonflies *(Leucorrhinia proxima* and *L. hudsonica)* and the ubiquitous Four-spotted Skimmer *(Libellula quadrimaculata)*. Two types of emeralds were present: the Beaverpond Baskettail *(Epitheca canis)* and the American Emerald *(Cordulia shurtleffi)*. Common Green Darners *(Anax junius)* could be seen patrolling the stream at high speed; they were also showing mating behaviour.

On 10 June, a Horned Clubtail *(Arigomphus cornutus)*, a species of Pond Clubtail, was observed emerging at the edge of the pond (Fig. 3) (see inside front cover, bottom). A third species of whiteface was recorded, the Dot-tailed Whiteface *(Leucorrhinia intacta)*. The Taiga Bluet *(Coenagrion resolutum)* was present only in the last two surveys in June, and only a single male was found each time. The Sedge Sprite *(Nehalennia irene)* appeared for the first time on 16 June but was found in considerable numbers during the next five surveys.

1 July was a hot (28°C), humid day, and the Four-spotted Skimmers were abundant. Chalk-fronted Corporals *(Ladona julia)* were also present. American Bluets (*Enallagma* sp.) were common; by this time in the summer, the spring species had been replaced by the summer species, Marsh and Hagen's Bluets *(E. ebrium* and *E. hageni.)*

On 14 July, several species appeared that are considered river species, which were likely just hunting in the pond area. They were the Midland Clubtail *(Gomphus fraternus)*, which is common on the Winnipeg River at Pinawa, and the River Jewelwing *(Calopteryx aequabilis)*, a beautiful broad-winged damselfly common on the nearby Pinawa Channel. These will not be counted in the Temporal Design study because that study was considering only lentic bodies of water, but they are included here. Also on 14 July, the first spreadwing was seen. It was still immature, but more spreadwings were seen on 20 July; by 1 August, they were common. Both Northern and Sweetflag Spreadwings *(Lestes disjunctus* and *L. forcipatus)* were found but are counted together in Table 1. These damselflies emerge later in the summer because they overwinter as eggs and therefore must complete the larval stage in the spring.

The survey completed on 20 July showed the widest diversity, with a total of 13 species, and the greatest abundance. All bluets captured were Hagen's Bluet. A forktail damselfly was found for the first time, the Eastern Forktail *(Ischnura verticalis)*. The Four-spotted Skimmers had become less common and this was their last (recorded) day of the summer. Not only were Chalk-fronted Corporals found but also a few Common Whitetails *(Plathemis lydia)* and one Twelve-spotted Skimmer *(Libellula pulchella)*. The first blue darner of the season was observed but not captured or identified to species. Also the first meadowhawk of the season was observed. By 1 August, little red meadowhawks were common and found to be all White-faced Meadowhawks *(Sympetrum obtrusum)*.

1 August was the first record for the Tule Bluet *(Enallagma carunculatum)*. These were never very common at the pond and tended to be found in the rocky areas away from the water. On this warm August day, the big blue darners (*Aeshna* spp.) were cruising fast along the edges of the pond, while the smaller red or yellow meadowhawks patrolled the shore. The weeds were full of spreadwings and Sedge Sprites *(Nehalennia irene)* and the bluets were flying low over the weedy areas of the water looking for places to mate and lay their eggs.

On 9 August, another interesting spreadwing appeared, the Slender Spreadwing *(Lestes rectangularis)*. This long delicate insect was found on three days of the survey. On the same day, a Swift River Cruiser *(Macromia illinoiensis)* was found at the pond. As its name suggests, this is not truly a pond species so it was probably just visiting the area and not breeding in the pond. 9 August was the last sighting of a whiteface (*Leucorrhinia* sp.) for the summer.

On 20 August, another clubtail species was recorded, the giant Dragonhunter *(Hagenius brevistylus)*, one of which was eating a Black-tipped Darner *(Aeshna tuberculifera*; the darner was not recorded on my species list because it was not found alive). Another species of darner also appeared in small numbers late in the summer, the Zig-zag Darner *(A. sitchensis)*. White-faced Meadowhawks flew right up until 12 September, but three other meadowhawks also appeared late in the summer. The Autumn Meadowhawk or Yellow-legged Meadowhawk *(Sympetrum vicinum)* first found on 15 August, was quite common by 9 September, and was still mating and laying eggs on 27 September. I had expected to find more Black Meadowhawks *(S. danae)* late in the season but found only a single individual, on 15 September. The Saffron-winged Meadowhawk *(S. costiferum)* was found on four dates in August and September, including the last on 27 September.

Another late-season species was the Spotted Spreadwing *(Lestes congener)*. These were not seen until 31 August, by which time they were already quite common, showing mating behaviour and

Dragonflies Observed	Abundance on Given Date																
	6/5	6/10	6/16	6/25	7/1	7/14	7/20	8/1	8/9	8/15	8/20	8/25	8/31	9/9	9/12	9/15	9/27
Calopterygidae																	
Calopteryx aequabilis						1											
Lestidae																	
Lestes congener													3	2	2	2	1
L. disjunctus-forcipatus						1	2	4	4	4	4	4	3				
L. rectangularis											1	1			2		
Coenagrionidae																	
Coenagrion resolutum			1	1													
Enallagma spp.	3	3	4	4	4	4	4	4	4	3	3	1	1				
E. boreale																	
E. cyathigerum																	
E. ebrium																	
E. hageni																	
Enallagma carunculatum								1	2	1	1	1					
Nehalennia irene			1	3	3	4	3	3									
Ischnura verticalis							2	3	3	2	2	1	1	1			
Aeshnidae																	
Anax junius	1	1	2					2									
Aeshna spp.						2	1	2	2	4	4	4	3	3	2	3	1
A. canadensis																	
A. eremita																	
A. interrupta lineata																	
A. umbrosa																	

Aeshna sitchensis										1	1						
Gomphidae																	
Arigomphus cornutus		1	1	2	2	3	3	1									
Gomphus fraternus						1											
Hagenius brevistylus											1						
Macromiidae																	
Macromia illinoiensis									1								
Corduliidae																	
Cordulia shurtleffi	2	3	2	2													
Tetragoneuria canis	2		3	2	1												
Libellulidae																	
Libellula quadrimaculata	3	2	2	4	4	2	2										
L. pulchella							1										
L. (Plathemis) lydia							1					1					
L. (Ladona) julia				3	2	3	2										
Leucorrhinia sp.		2	4														
Leucorrhinia hudsonica	1																
L. proxima	1			3	3	4	4	2	1								
L. intacta		1	3	3	3	4	3	2									
Sympetrum costiferum													1	2		1	1
S. danae																1	
S. obtrusum							1	3	3	3	4	4	4	3	2		
S. vicinum										1		1	1	3	3	2	2
Total Abundance	13	13	23	27	22	29	29	27	20	18	21	19	17	14	11	9	5
# of Species on Date	6	7	10	10	8	11	13	10	8	7	9	10	8	6	5	5	4

ovipositing. They were found right up to the end of the season.

In spite of my best efforts, I was only able to complete 17 surveys, and they were sometimes closer together than 5 days and sometimes farther apart than 9 days.

Conclusions

These data present a simple picture of the sequence of odonate species that lived around one little pond in the course of one summer. I hope that this list will help naturalists to realize that the time of year can make a big difference for successful searching. The most species found on a single day was only 13; it took a whole summer's effort to come up with 36 species. You do not need to travel far; the pond or lake in your area will certainly yield a great diversity if you take the time to visit it over the course of a summer.

Acknowledgements

I thank Mary Van Buskirk for her help with editing this manuscript; David Hughes for the use of his dragonfly photographs; and of course, my husband Colin for being so willing to accompany me in the field.

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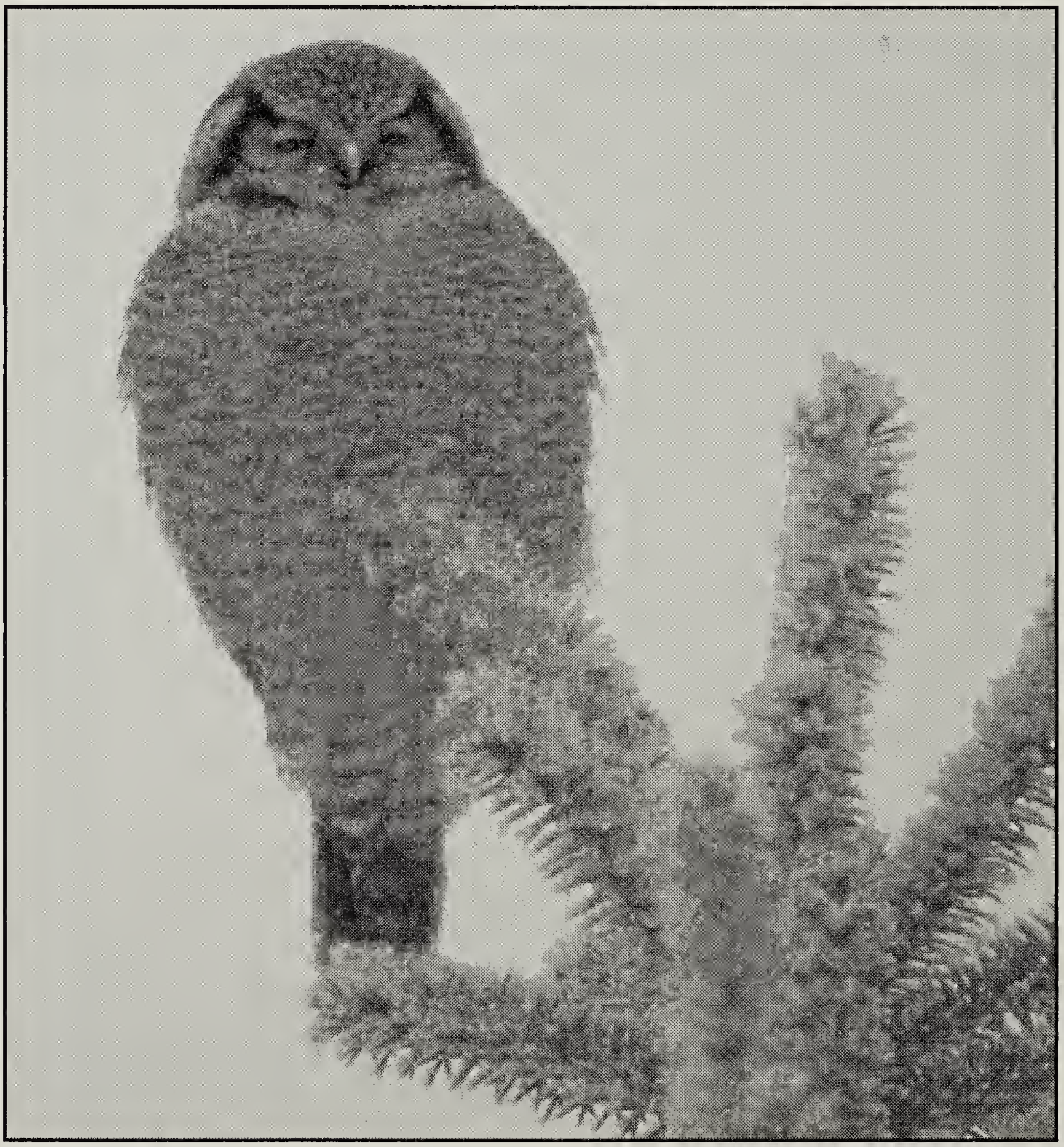

Hawk Owl. *Nick Saunders*

PLANTS

NODDING ONION (*ALLIUM CERNUUM*), A RARE PLANT IN SASKATCHEWAN

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The genus *Allium* L., has been traditionally circumscribed in the tribe Allieae of the Liliaceae,[5,10] but recently, several authors have placed this genus in its own family Alliaceae.[1,2,9] The genus *Allium* is characterized by the presence of bulbs enclosed in membranous (sometimes finely fibrous) tunicas, free or almost free tepals, and often a subgynobasic style (style arising near the base of the gynoecium). The mesophyll cells of most taxa produce remarkable amounts of cysteine sulfoxides, the complex chemicals that are responsible for producing the characteristic and familiar odor and taste of onions, garlic, and chives, and which may have potential therapeutic effects.[3]

The genus *Allium* includes ca. 700 species widely distributed in the northern hemisphere, especially in the temperate regions of Eurasia, but it is also found in the southern hemisphere in regions of Africa and Central and South America.[7,9,10] It has a main center of diversity in southwestern and central Asia and a smaller secondary area of diversification in North America. Thirteen taxa, excluding cultivated or introduced species, are known to exist in Canada. According to Harms' 2003 checklist of Saskatchewan plants, five *Allium* species (*A. cernuum* Roth, *A. geyeri* S. Wats., *A schoenoprashum* L., *A. stellatum* Ker Gawler, and *A. textile* A. Nels. & Macbr.) are distributed in Saskatchewan.[4] However, based on our observations of specimens in the W. P. Fraser Herbarium (SASK), we have come to the conclusion that *A. geyeri* does not occur in Saskatchewan.

The purpose of this paper is to provide an update on the occurrence of *Allium cernuum* (Nodding Onion), a rare provincial species, and document the status of Saskatchewan populations with an emphasis on the southern population without disclosing exact localities. We expect the information on this species will be useful for future monitoring and conservation programs, assessments of rarity status, population dynamics and genetic diversity. *Allium cernuum* (Fig. 1) (see inside front cover) is one of the most widespread North American species of the genus. Despite its wide distribution, this species is quite rare in Saskatchewan and is ranked as 'S1S2' by the Saskatchewan Conservation Data Centre (SCDC).[8] According to the SCDC, the S1 ranking denotes extremely rare species (five or fewer occurrences) while S2 indicates rare species (six to 20 occurrences). In turn, Harms included this species in the vulnerable (VUL) category,

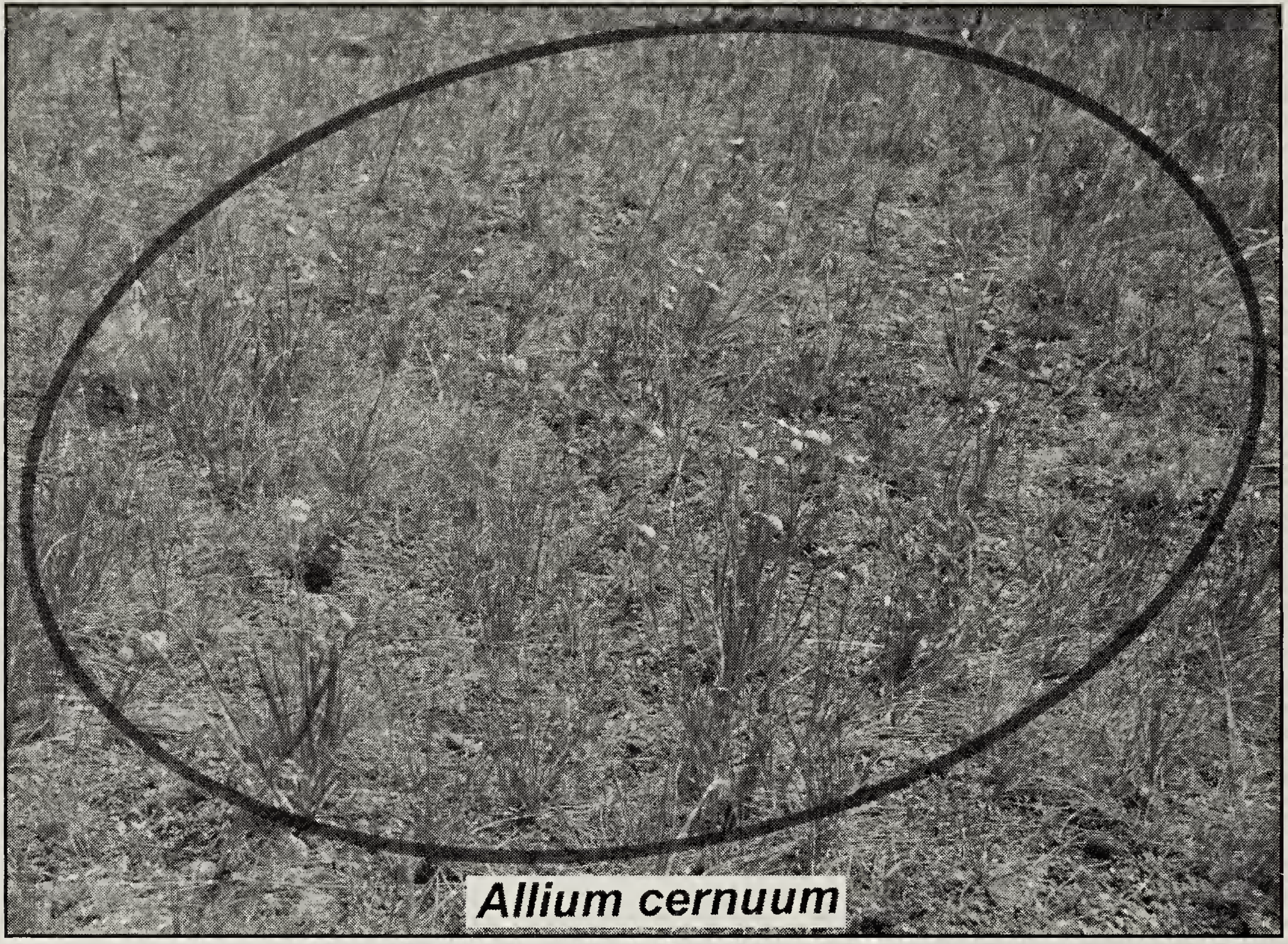

Figure 2. Habitat and population of Allium cernuum *(circled) in southwestern Saskatchewan. Note the flower buds in the specimens. Photo taken in July 2009.*

indicating species at risk, because of its declining numbers with subsequent special concern.[4]

Taxonomically, *Allium cernuum* is closely related to *A. stellatum*. The character most commonly used to differentiate these two species is the orientation of the umbel-shaped inflorescence. In both species, the inflorescence may often be nodding in the budding stage, but in *A. stellatum*, the inflorescence usually becomes erect during anthesis. In *A. cernuum*, the peduncle remains permanently curved near the apex (Fig. 1A) (see inside front cover, top); however, the inflorescence may sometimes become erect or nearly so.[6] In addition, the perianth shape in *A. cernuum* is campanulate with ascending tepals, whereas in *A. stellatum*, it is stellate with apically spreading tepals.

To our knowledge, various populations of *Allium cernuum* have been reported in two main localities, one in the Meadow Lake area (central western Saskatchewan) and another in the Cypress Hills region (southwestern Saskatchewan). It has also been collected near Yorkton in southeastern Saskatchewan. In July 2009, we conducted fieldwork and found Nodding Onion in the southwestern region of Saskatchewan. The populations were located near roads and margins of cliffs at an altitude of ca. 1300 m growing together with *Apocynum androsaemifolium* L., *Campanula rotundifolia* L., *Eriogonum flavum* Nutt., *Monarda fistulosa* L., and *Potentilla fruticosa* L. (= *Dasiphora fruticosa* L.), among others. Contrary to the *Flora of North America*, which indicates that *A. cernuum* prefers moist soils in mountainous and cool regions,[6] the SW Saskatchewan population of Nodding Onion is distributed on dry gravelly to sandy soils. The individuals of this population were not fully blooming. Most plants had flower buds near to anthesis (Fig. 2). Fortunately, we were able to find some plants with flowers, from which we observed floral organs, such as the entire filament margins and the characteristic crested ovary (Fig. 1C) (see inside front cover, top). In addition, reproductive parts preserved in 70% ethanol (EtOH) from one herbarium voucher and from 20 other samples collected from living specimens in ten colonies (two individuals per colony) of the same locality, are being investigated.

Based on field observations, the flowering time of this Saskatchewan population is from the second week of July to the first week of August (although 2009 may have been a somewhat atypical year for phenotypic observations; V. Harms, University of Saskatchewan, pers. comm.). In terms of population size and number of individuals, our numerical estimate of this rare species in southwestern Saskatchewan is about 300 individuals, distributed in ca. 0.5 ha. The largest population we measured occupied an area of ca. 2 m^2, in which we estimated 70 blooming individuals (Fig. 2). In some areas, this plant was locally abundant to the extent that it formed an herb mat.

According to herbarium records from 1949 and 1950 at SASK, *Allium cernuum* has been collected at Meadow Lake, Alcott Creek, and two other nearby areas in the west central portion of the province. Nonetheless, the original habitat, fescue prairie, indicated in voucher specimens no longer exists, especially in areas near roads. In addition, the relatively recent clearing of the original vegetation and the prevailing habitats in Alcott Creek and surrounding areas, which are quite swampy and unsuitable for *A. cernuum* to grow, have apparently played a major role in the waning of this population (K. Remarchuk, University of Saskatchewan, pers. comm.). In turn, the Central Block locality of the Cypress Hills population was visited this summer, but only two individuals were found. Although the West Block population was not visited, the apparently low rate of reproduction of this species in the Central Block is reflected in the low number of individuals. However, more intensive field work is necessary to make a more accurate assessment of the current populations.

Some inferences can be made with these data and observations. Foremost, it appears that the general Meadow Lake area population may have vanished, at least from the most accessible areas, due primarily to human activities, which suggests the enforcement of better conservation practices in the preservation of species at risk. Secondly, while our data for the southwestern population are encouraging in terms of population number, this species might not be within the S1S2 rank as indicated by the SCDC, and Harms' vulnerable status may be more appropriate, as this species is locally abundant. However, considering that the existence of the Meadow Lake population is questionable, we recommend continuing to rank this species as S1S2 until more extensive surveys of this and the Cypress Hills populations are conducted.

Acknowledgements

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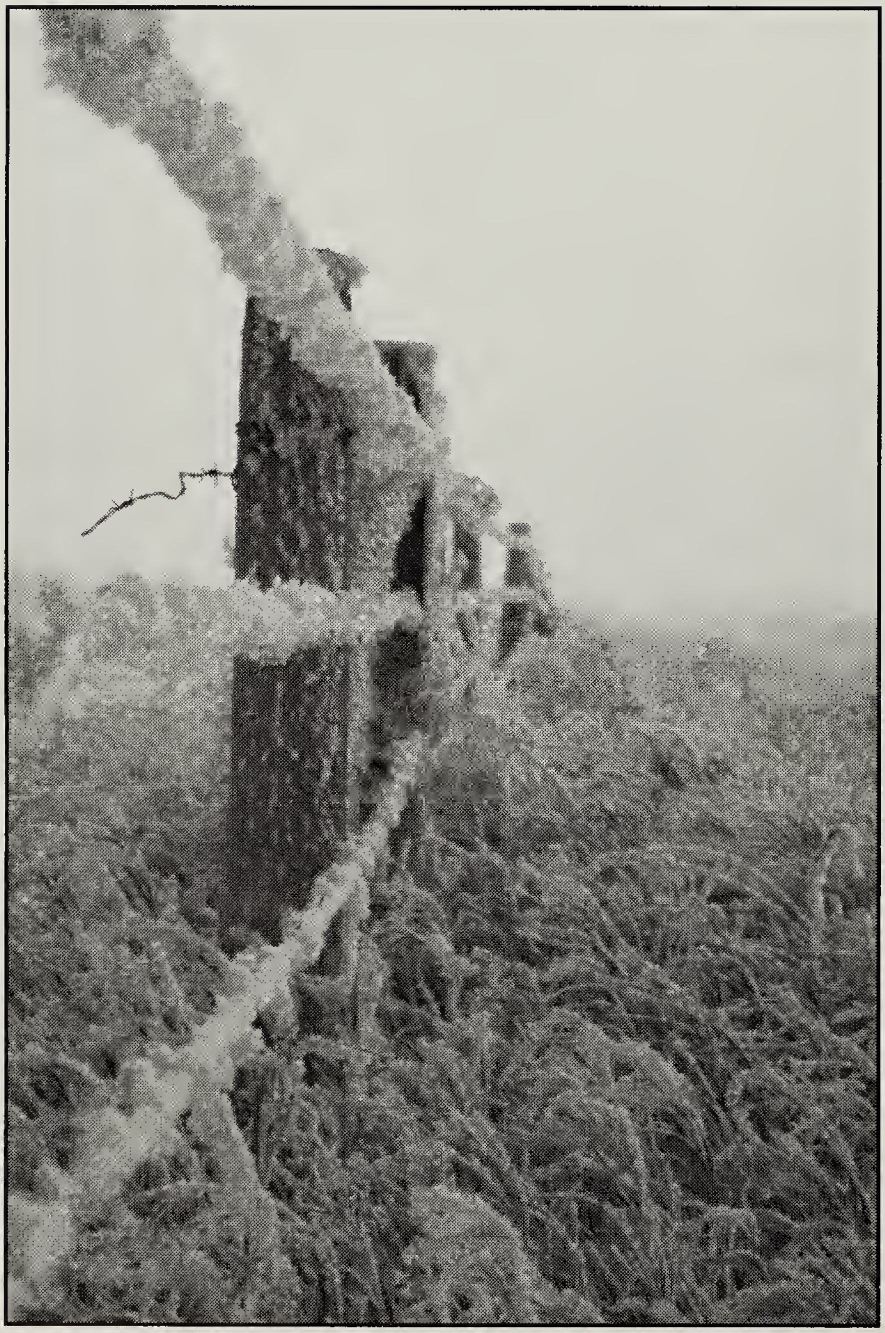

Frosty fence line.
Kerry Hecker

NOTES AND LETTERS

SASKATCHEWAN MUNICIPAL AWARDS PROFILES - CITY OF REGINA AND TOWN OF MOSSBANK

The City of Regina was recently recognized for the leadership role it has taken in environmental conservation. This May, the Queen City was presented with the 2009 Saskatchewan Municipal Award in Environmental Stewardship for its partnership work in the development of McKell Wascana Conservation Park, a native prairie reserve on the city's southeast edge.

Designed to celebrate the achievements of the province's municipal governments, the Saskatchewan Municipal Awards Program annually presents a total of five awards in five categories – regional partnerships, economic development, community development, environmental conservation, and leadership. At the 2009 awards ceremony, the City of Regina was named the recipient of the Environmental Stewardship award, while the Town of Mossbank earned the title of runner-up for the Old Wives Lake Nature Area.

Regina's Only Conservation Park Receives Provincial Accolades

The award-winning McKell Wascana Conservation Park is providing a place for naturalists of all ages to experience and learn about the ecology of the Regina floodplain. Covering about 170 acres within the city limits and beyond, the park is Regina's only remaining native prairie ecosystem. It includes a natural stream, prairie upland, grassland, and a small wetland habitat, all of which has been carefully managed and preserved through a partnership between the City, Ducks Unlimited Canada (DUC), and the McKells, a local family that has owned the land next to the city limits since the late 1800s. DUC and Robert McKell spearheaded the conservation project, with the City of Regina eagerly coming on board when the park was first proposed.

"The park is a great place for residents and visitors to experience nature, to go birdwatching, and to go for a walk on the trails," says Dominique Clincke, Coordinator of Landscape Design with the City of Regina. "School groups can come out and take advantage of the outdoor classroom where they can learn about the prairie ecosystems. At the dock, they can go pond dipping, discover water creatures and learn about the prairie environment firsthand."

For the City of Regina, McKell Wascana Conservation Park not only provides an educational area, it also fits in well with the city's ongoing efforts to increase environmental sustainability through the use of native grasses. Clincke explains that the native grasses in the park are better for the surrounding creek environment. They help to prevent erosion, require little maintenance, can withstand drought, and are non-invasive to the neighbouring farms and urban spaces.

The conservation area is certainly worth a visit. In the summer, the park is a vibrant landscape of green grassland. The vivid colour of the prairie plants is complemented by the expanse of sky overhead and the sounds of the abundant bird life in the area – mallards, Canada Geese, swallows, sparrows, meadowlarks, Red-winged Blackbirds, Yellow-headed Blackbirds, and more. Foxes, coyotes, Leopard Frogs, garter snakes, and White-tailed Deer also inhabit the park.

The park's entrance begins at the newly constructed amphitheatre, a beautiful concrete platform that will provide an outdoor classroom for school tours and children's programs. Walking through the amphitheatre and down along the trodden pathway leads to a wide timber bridge. The bridge crosses over the park's slow moving stream – Wascana Creek – and is a good place to take in a panoramic view of the park.

A farther walk through the grass trail, with a slight turn to the west, leads to McHattie Dock. The grasses along this portion of the mowed trail, as well as in several other sections of the park, have been reintroduced by DUC over the past two years. The careful sowing of the grasses has ensured that the park contains native flora, including Western Porcupine Grass, Green Needlegrass, various kinds of wheatgrass, Canada Wildrye, June Grass, and Blue Gramma Grass.

The grass trail to the dock turns into a somewhat narrow wooden walkway, which then enters a high growth of cattails and eventually opens onto the dock itself. A secure wooden platform, McHattie Dock rests just on the surface of the water on a wide part of the river. It's the perfect place to go pond dipping to discover river creatures.

Walking back to the main path from the dock and heading south leads to more trails. This area of the park, which is still under development, includes walkways that run both east and west alongside the meandering stream and also venture farther into the plains. The park's 3-km trail network is for the most part mowed grass, with a proposed pathway between the amphitheatre and the dock to be covered in crusher dust. Interpretive signs and benches will be up for visitors by the end of the summer of 2009.

To reach the park, travel south on Prince of Wales Drive to the Wascana View community and follow Wascana Circle loop east. Found on the south side of Wascana Circle, the park is unmistakable as a large clearing between two residential areas.

Old Wives Lake Nature Area Named Provincial Award Finalist

The Old Wives Lake Nature Area is receiving well-earned attention for its effective work in eco-tourism and habitat conservation. At the Saskatchewan Municipal Awards ceremony held in May, the Town of Mossbank was recognized for its development of the Old Wives Lake Nature Area when it was named a runner-up in the awards category of Environmental Stewardship.

Located north of Mossbank, Old Wives Lake is the fourth largest saline lake in North America and is a designated migratory bird sanctuary. A staging area for 500,000 waterfowl each year, such as Canada Geese, Snow Geese, and Tundra Swans, the lake is also a nesting habitat for American White Pelicans and Double-crested Cormorants.

The Town of Mossbank has for many years worked to conserve the Old Wives Lake region, recognizing it as a vital habitat for many bird species and as a place where Saskatchewan's native prairie remains untouched and protected.

Melanie Baker, the town's Economic Development Officer, explains that the development of the Old Wives Lake Nature Area was a community effort. "The people who live in the area have always been strong believers in environmental sustainability. This project has helped to preserve and promote the area, along with the community, and is a result of community members working together."

The Town of Mossbank has ensured that the area is as eco-friendly as possible, using flax straw along the trail, installing a composting toilet, and leaving the site otherwise untouched. At the Old Wives Lake Nature Area, visitors can step into the prairie wilderness and experience the smells, sights and sounds of the flatlands. Although some distance from Old Wives Lake, the area is a good spot for bird watching and discovering native flowers, grasses and shrubs.

Visitors can tour the area on a 2.4-km trail loop, with a walking time of about 1 hour. The trail winds through mixed prairie grasslands, with the pathway itself switching between gravel, flax straw and dirt roadway.

On the first half of the trail loop, a gentle slope clothed in sagebrush rises on the south, while on the north, Old Wives Lake can be made out in the distance across the flatland, banded by a white salt coat and backed by the blue hills behind. The prairie sky stretches above in a dramatic display.

A few rest stops along this half of the trail provide a scenic view of the distant lake and a place to spot the many upland birds and waterfowl in the area. At these stops and along the pathway, interpretive signs tell of the Piping Plover, the American Avocet, the Killdeer, and native vegetation.

A sheltered viewing tower on top of the small rise marks the trail's halfway point. The tower houses a picnic table as well as signs about the lake's staging area, the Isle of the Bays, and prairie birds and waterfowl. Behind the tower, a large tree – one of the few in the area – provides shade for a picnic table underneath, another perfect resting spot.

From the tower, the trail curves back to the west. On this portion of the route, the focus turns from Old Wives Lake to the countryside opposite. Although at first sight the landscape seems only to be marked by distant trees and farm yards, it soon becomes clear that there is much life here. Many prairie birds nest in the native grasses, and although not always seen, their presence is revealed by their songs, such as the distinct call of the Lark Bunting. Other birds to watch for are the Western Meadowlark as well as Red-winged and Yellow-headed Blackbirds, Yellow Warblers, Barn Swallows, sparrows, and Saskatchewan's provincial bird, the Sharp-tailed Grouse. Hawks also make their home here, including the Red-tailed Hawk, Swainson's Hawk, and North America's largest, the Ferruginous Hawk.

The importance of the conservation area is reinforced by several interpretive signs about native species, including a sign about endangered birds of prey living in the area – the Burrowing Owl and the Loggerhead Shrike. The last interpretive sign on the route describes the other wildlife that visit here: rabbits, Pronghorn, coyotes, White-tailed and Mule Deer, and foxes.

Besides animals, the area has also been a home to the peoples of the prairies. Old Wives Lake has been so named because of the inspiring history of the First Nations peoples who once lived there, the account of which is told on the entrance sign to the area. The site was also used during World War II for military training, an era described on one interpretive sign, and which will be commemorated in the next years with the creation of the area's Interpretive Centre.

To reach the Old Wives Lake Nature Area (OWLNA) from Moose Jaw, travel southwest on Highway #2 to Mossbank.

Drive north through the town following the OWLNA signs, which have a symbol of birds in flight with the OWLNA initials underneath. After passing through the town, travel west on a paved road for 2 km, then turn north onto a sand road. The road leads on for 7 km, after which the nature area can be seen on the right. There is little shelter on the route, except at the rest stops, so protect yourself from the sun with a hat and long sleeves.

The 2009 Saskatchewan Municipal Awards runner-up is a site worth experiencing. The grand opening of the area was held on 8 August 2009, in conjunction with the Old Wives Lake Festival.

- *Katie Boyce*, Communications Consultant, Benchmark Public Relations, 2368 Rae St., Regina, SK, S4T 2G2; E-mail: <kboyce@benchmarkpr.ca>

Picnic site at Old Wives Lake Nature Area, near Mossbank, SK.

THE CHRISTMAS BIRD COUNT IN CANADA

The Christmas Bird Count has been a holiday tradition for over a century in North America. In many families—certainly in mine—it is at least as important as turkey and cranberry sauce in the observation of the season. Although it began as a statement of early environmental action, it remained largely a social and sporting pastime until the mid-1900s, when the numbers of participating counts rose exponentially and began to provide valuable data on the distribution and population trends of birds wintering on the continent.

The Christmas Bird Count was founded in 1900 by American biologist and early environmentalist Frank Chapman, who was concerned about the practice of the Christmas Side Hunt—an event in which men formed teams and tried to shoot everything they saw. I presume prizes were awarded for the teams with the most species and/or individuals in the bag. Chapman put a notice in the Audubon journal *Bird Lore* asking interested parties to go out on Christmas Day and count birds instead of shooting them. Twenty-five counts were submitted to *Bird Lore* that first year, including two from Canada: Toronto, ON, and Scotch Lake, NB.

Interest in the Christmas Bird Count built slowly in the early 1900s. According to my records, the earliest Saskatchewan count took place in Lashburn in 1913, followed by Eastend in 1919 and Saskatoon in 1935 and 1936 (the latter sent in by a young Farley Mowat). Audubon continued to publish the results in *Bird Lore* and its successor, *American Birds*. The *Canadian Field-Naturalist* began to publish some Canadian counts in 1924 and continued that practice until 1960.

In 1942, the Saskatchewan Natural History Society (SNHS) began its own Christmas Bird Count, publishing the results in *Blue Jay*. Eight counts were submitted in that first year, but the only count that sent its results to Audubon in those early years was Yorkton. These counts published by *Blue Jay* followed the Audubon rules in that they were conducted on one day in the Christmas period within a 24-km (15-mi) circle, but some did not meet the Audubon guidelines of a minimum of 8 party-hours of field observation. The number of SNHS Christmas Bird Counts increased steadily, and by the 1980s there were 80 to 90 counts taking place each year, peaking at 103 in 1997 and 2001.

In 2000, Bird Studies Canada (BSC) took over the coordination of Christmas Bird Counts in Canada from the National Audubon Society, although the data collected still go into the continental database at Audubon. At that time there were 257 counts sent in to the Audubon Society from Canada each year; that number rose quickly after 2000 and has now leveled off at about 370 counts—about 20 of them from Saskatchewan. At about the same time, Audubon stopped publishing the full results of each count in *American Birds*, instead publishing only summary reports for each region and articles on bird biology that use Christmas Bird Count data. BSC publishes the Canadian summary reports in its *BirdWatch Canada* magazine. The full data of all counts ever sent in to Audubon and/or BSC are now available online at www.audubon.org/bird/cbc. The database can be searched by count, i.e. you can produce a table of all birds seen on any count for any period of time, or by species, e.g. you can produce a graph or table of numbers of Sharp-tailed Grouse seen in Saskatoon, or in Saskatchewan as a whole, for any period of time.

The Audubon database is used continuously by biologists and naturalists around the globe. CBC results are used to produce winter distribution maps for all species in the United States and southern Canada. In 2007, Audubon conducted an in-depth analysis of population trends of birds using CBC data; one of the results of this was Common Birds in Decline, a report available at http://stateofthebirds.audubon.org/cbid/. This data analysis is also used regularly by agencies such as the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) in their assessments of species at risk. Two species—the Rusty Blackbird and the Newfoundland subspecies of the Red Crossbill—have recently been listed by COSEWIC largely on the basis of CBC data.

I would encourage anyone interested in birds to visit the CBC website and explore the huge database. To maintain this database, Audubon requires that counts submitting data pay a participation fee amounting to $5 for each field observer. Feeder-watchers, count compilers, BSC members, and participants 18 years of age and under are exempt. This fee is not a fundraiser for BSC or Audubon, but does help to defray part of the costs in running this large and valuable program. Most participants happily pay the fee, knowing that it means their hard work in the cold and snow will be put to valuable use in bird conservation. In many counts, local clubs pay the fees for their members, or find local businesses to sponsor the count.

We now have the ability to add data into the database from historical counts that were not submitted to Audubon, and will be working in the years to come to make sure that all participating counts have their full complement of data available online. BSC would like to see all eligible Saskatchewan counts in this database.

As someone from a slightly milder winter climate, I greatly admire the enthusiasm of Saskatchewan birders for this mid-winter event. Birders and biologists from all over the continent thank you for your commitment to enjoying birds in all seasons and contributing to an invaluable source of information on the birdlife of North America.

- *Richard J. Cannings,* Bird Studies Canada, 705 Sunglo Drive, Penticton, BC, V2A 8X7; E-mail:<dickcannings@shaw.ca>

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To me a lush carpet of pine needles or spongy grass is more welcome than the most luxurious Persian rug.

- Helen Keller

PHOTO NOTE

This photo (see back cover) of a Loggerhead Shrike feeding its young was taken on 10 July 2009 on Highway 663 south of Saskatoon, SK. The day we first saw these birds was on an outing with the Golden Eagles, a senior group of birders from the Saskatoon Nature Society. We go out most Thursdays from April through October. We first saw these birds on the Thursday, and my husband and I went back again on the Friday and spent some time watching them. They were in bushes on the side of the road, near a slough just before a railway crossing. We have seen shrikes in the same area on previous occasions. There were four young and two adults in this nest, and we also saw two other adults a bit farther down the road. The young shrike in this photo is getting a meal consisting of part of another small bird that I saw being plucked and taken apart. Other items seen being fed to the young ones were grasshoppers. The two adults were very busy finding food for their brood of four.

Alison Baudru, 70 Lindsay Drive, Saskatoon, SK, S7H 4B4; E-mail: <ali-loub@shaw.ca>

THE STURDY RIVER LIMPET – RANGE EXTENSION IN SASKATCHEWAN

The Swift Current Creek Watershed Stewards (SCCWS) is a non-profit organization dedicated to promoting ecological sustainability within the Swift Current Creek Watershed. To understand the health of the watershed, a 4-year program of field studies and review was undertaken in 2004. The Environmental Effects Monitoring (EEM) document developed by Environment Canada was chosen by the SCCWS to ascertain the impacts that humans in Swift Current and the surrounding area may have on Swift Current Creek. Using the EEM document as a guide, the SCCWS developed a 4-year plan to sample the health of the watershed using three indicators: water quality, macroinvertebrates, and fish. This report details the particularly interesting finding of a number of specimens of *Ferrissa rivularis*, the Sturdy River Limpet (SRL; Fig. 1), during macroinvertebrate sampling in Swift Current Creek throughout the summer of 2004.

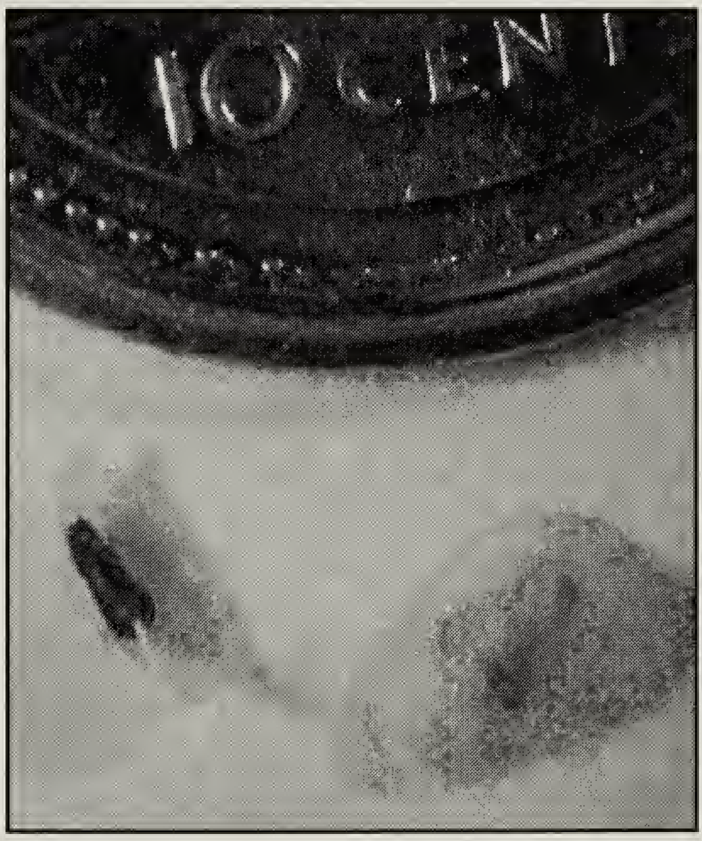


Figure 1. Photo of the Sturdy River Limpet collected from Swift Current Creek, SK, in 2004.

The distribution of freshwater limpets in Canada is not well understood. Clarke suggested that the range of the SRL in Saskatchewan was restricted to the southeast region.[1] Recently, the SRL has been found in Candle Lake in central Saskatchewan during lake surveys conducted in 2001 and 2002.[2] Similarly, the SRL was discovered in the North Saskatchewan and Red Deer Rivers by staff of the Alberta Research Council.[3] In addition to these recent findings, the SCCWS discovered 14 SRL specimens (mean length = 4.5 mm; range 3.5–5.0 mm) at two sample sites during macroinvertebrate sampling in Swift Current Creek in 2004. A subsample (nine specimens) of the limpets collected was sent to the University of Winnipeg for confirmation of identification.

The SRL was found at two sites in Swift Current Creek (Fig. 2). One of the two sites was an area of fast-flowing water, whereas the other was an area of fairly slow-flowing water. The majority of SRL specimens (12 of 14, or 86%) were found at the site with fast-flowing water, an indication of habitat preference that has also been found in other studies.[3] Flowing water may therefore be very important to the SRL. Little is known about the range of habitat conditions that the SRL will tolerate; however, the following water quality data were collected in Swift Current Creek at the sites where the SRL specimens were found. Temperature varied from 18 to 22°C, pH ranged from 8.5 to 8.7, and resistivity (inverse of conductivity) was 510 to 525 µohms.

Given that there is little information about the SRL, more focused sampling is needed to better understand the physiological requirements and distribution of this

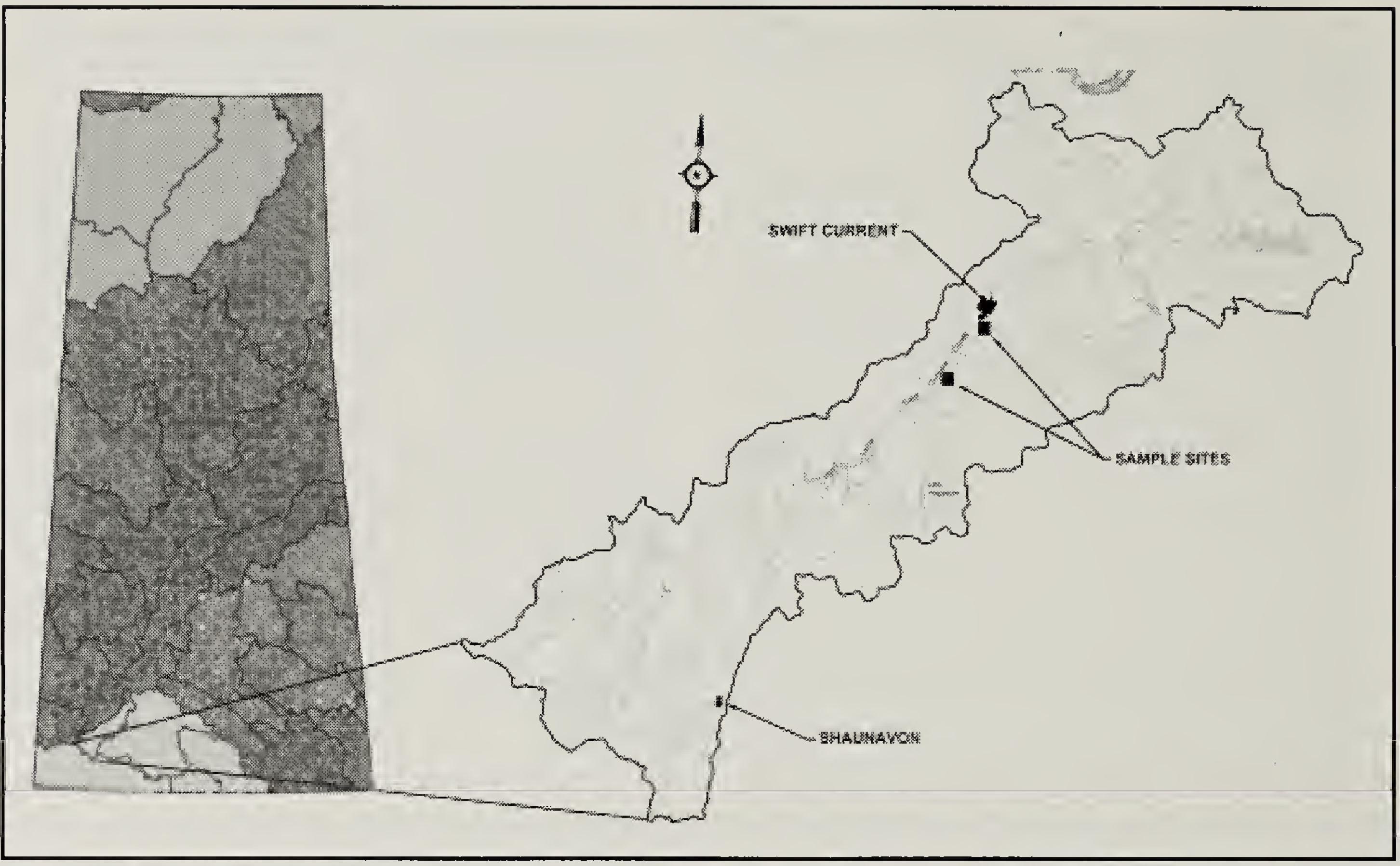


Figure 2. View of Swift Current Creek Watershed showing the two sites where the Sturdy River Limpet was discovered and its spatial relation within Saskatchewan. (Map: Saskatchewan Watershed Authority, available at: <www.swa.ca/Maps/default.asp>)

limpet in both the Swift Current Creek and in Saskatchewan.

Acknowledgements

We thank the Swift Current Creek Watershed Stewards for the Swift Current Creek Monitoring Project; Cher King for the planning of the project; the landowners who permitted access to the sampling sites; Dr. Eva Pip (University of Winnipeg) for identifying *F. rivularis*; Keith Hanson (SPARC) for the loan of a dissecting stereoscope for species identification; Dr. Yantai Gan (SPARC) for the use of a dissecting stereoscope with digital photography capabilities to photograph the limpet; and Ron Jensen for input into this article.

1. CLARKE, A.H. 1981. The Freshwater Molluscs of Canada. National Museum of Natural Sciences, Ottawa, ON.

2. PARKER, D. 2002. Candle Lake Aquatic Macroinvertebrate Survey (2001 – 2002). Available via the Internet at <http://www.usask.ca/biology/skabugs/CandleL.html>.

3. PRESCOTT, D. and CURTEANU, M.M. 2004. Alberta Sustainable Research Development. Survey of Aquatic Gastropods in the Central Parkland Subregion of Alberta (Alberta Species at Risk Report No. 92). Edmonton, AB.

* * *

Those who dwell, as scientists or laymen, among the beauties and mysteries of the earth are never alone or weary of life.

- Rachel Carson

CULTIVATING OUR ROOTS – GROWING AUTHENTIC PRAIRIE WILDFLOWERS AND GRASSES

NORA STEWART. 2009. Nora Stewart, Arcola, SK. ISBN 978-0-9811442-0-7.
Paperback, coil-bound, 155 pages, 28 × 21.5 cm, $29.95 CAN

It was with great delight that I heard the news – "Nora Stewart is writing a book!" As a biologist trying to accomplish the re-creation of native prairie grassland, I have consulted many times with Nora. Her expertise in finding, harvesting, cleaning, storing, and selling native prairie seeds has already been generously shared with many people on a one-to-one basis. Now, this expertise is written down in comprehensive form for posterity, the first example of such a book that I know of. This book will be most useful as a guide for people who are growing native grass and wildflower seeds for sale, and will also be a great resource for those involved in reclamation, remediation, conservation, and xeriscaping.

What do you get?

Cultivating Our Roots is a relatively large, ring-bound, soft-cover book, containing 155 pages of information about native plants and how to work with them. This book is meant to be used as a reference guide and a field guide – and has been laid out as such. The technical information is presented in coherent, everyday language. The book itself is salted liberally with very specific illustrations, all of which are beautiful photos taken by the author and her husband.

This book has three major sections: "Concepts and Methods", "Grass and Forb (Wildflower) Descriptions", and "Additional Material".

Concepts and Methods

This 39-page section begins with an explanation of what native plants are, including a gentle introduction to terminology such as "forb", "weed", and "native prairie". It progresses to evaluating methods for acquiring seeds, and a description of the various tests that are available to assess seed quality. Thankfully, there is a relatively extensive section on weeds and the issues they cause, which can easily spell failure. There is also mention of other pesky things like mammals, birds, insects, plant diseases, and (wait for it!) the weather. Nora delves into the specifics of nursery propagation like site design, planning, and preparation, and then gets in to the meat of growing seedlings, whether indoors or out. Harvest is the next topic: timing, methods, and how to handle the seeds once they are off the plants and in your possession. Seed cleaning and proper storage are very important, as they maintain your investment of time and money. The section is rounded off with a short discussion of business considerations.

One of the most interesting and useful aspects of this book is the continual reference to equipment, including how to modify conventional farm equipment to work for native seeds, and what unconventional equipment works well (Dustbuster, anyone?).

Grass and Forb (Wildflower) Descriptions

This 94-page section describes 22 species of grass and 65 species of forb. The description includes defining characteristics of the plant and its flowering parts, appropriate timing for harvest, germination quirks, and tips for propagating it most effectively. Four photos accompany each species: flowering stage, seed stage, seedling, and scale photo of the seeds themselves. This is one of few books with seedling photos, and the only book I know of with photos of the seeds themselves – on graph paper for scale, no less! This is a great help to people working with seedlings and seeds.

Useful References

The last 16 pages of the book are included for serious plant growers. The best of the written references for this topic are listed, and all of these books and papers are pertinent to the Canadian Prairies. A quick summary of plant family characteristics is presented for ease of species identification. Delightfully, there are more scale seed photographs, and a guide to forbs by flower colour. As a nod to most of us who still work in imperial measurements, Nora has included a Metric/US conversion table. Appendix E lists the most local sources for equipment, information, and services, many of which are Saskatchewan businesses. The glossary is useful to help with necessary technical terms when working with plants. The book index contains both Latin and common names, making it relatively easy to find your chosen species when your mind simply won't supply one version.

The author and publisher also maintains a consistent message by including an Environmental Benefits Statement on the title page, stating the savings from using chlorine free paper and 10% post-consumer waste. This is a nice touch for a book with an environmentally aware topic.

All in all, *Cultivating Our Roots* is a primer on native plants, a technical guide to their propagation, and a rich resource for contacts both in the business world and for more information. This book is the culmination of Nora's hard-won knowledge over 15 years in this business. I wish that more people could summarize their work so usefully! The author has managed to maintain her unique voice in the text, which makes for some wry moments and entertaining observations.

Cultivating Our Roots: Growing Authentic Prairie Wildflowers and Grasses can be purchased through the Native Plant Society of Saskatchewan (<www.npss.sk.ca>), at some local bookstores such as Book and Brier Patch in Regina, or directly from Nora, if you are lucky enough to know her.

- Reviewed by Kerry Hecker, Area Manager, Last Mountain Lake National Wildlife Area, Canadian Wildlife Service, Box 280, Simpson, SK, S0G 4M0; E-mail: < kerry.hecker@EC.GC.CA>

EDITORS' NOTE: More information, sample pages, and purchasing information on *Cultivating Our Roots: Growing Authentic Prairie Wildflowers and Grasses* is available via the Internet at: <http://cultivatingourroots.com>.

THAYER BIRDING SOFTWARE'S BIRDS OF NORTH AMERICA FOR WINDOWS GOLD EDITION DVD

Thayer Birding Software. 2008. Thayer Birding Software, Naples, FL. DVD. $165 US. ISBN 1-934573-00-0

I previously reviewed Thayer's Birds of North America CD-ROM Version 3 in the June 2002 issue of *Blue Jay*.[1] Here, I evaluate the recently released (December 2008) Birds of North America Gold Edition DVD, which is Version 5 of the birding software. Thayer Birding Software has continued to revamp their instructional birding software products in order to keep up with continuing improvements in computer technology.

eField Guide View

The layout for the main instructional section called eField Guide View has remained essentially the same with a few enhancements. This part of the program has a major advantage over printed field guides and CDs by combining text, photos, audio, and video into single integrated package and is more up to date than the Birds of North America online. It provides information on all 957 bird species recorded in North America, including 32 new species on the 2008 American Birding Association Checklist. For most species, it has multiple photographs, improved range maps, maps of summer and winter abundance, 1200 outstanding song or call clips and sonograms (for 707 species). There are 2860 photos in this collection. Short video clips of varying quality are included for 551 species instead of the 121 video clips found in Version 3.

The species account information is organized in a field guide format, with scientific and common names (in English, French, German, and Spanish), AOU 4-letter band codes, order, family, abundance category, size, identification tips (in point form), habitat and behaviour (short paragraph), photos, range and abundance maps, and the sound mnemonic placed together on a single electronic page. A handy zoom-in feature is available for photos and abundance maps. There are quick-jump links to alternate photos, sound recordings and sonograms, abundance maps, and the Birder's Handbook (unchanged in Version 5) and an Internet online guide.

There are a number of new and improved features in eField Guide View that include pronunciation help, birding tips, and a limited repertoire of cheesy bird jokes from Petey the Parrot. There is an Internet online guide for each species, similar species view, and family plate. In Version 5, one can view up to six species at time in the similar species view. The family plate is an enhanced feature where you can view all members of a taxonomic family at a time. From the similar species view and family plate, one can zoom in to enlarge displayed photos, play sound recordings of displayed species or jump to specific species accounts in eField Guide View. In the family plate, one can link to similar or identical family description information on the DVD found in the Internet online guide.

In the latest version, range maps for 695 species have been improved to include political boundaries, Mexico, the Caribbean, and Central America and are broken down into breeding, wintering, and year-round ranges.

With Version 5, you can now import your comments, photos, songs, and videos, and they will seamlessly integrate into the eField Guide View. This feature appears to be aimed at more experienced birders and photographers. I have tried it for photos: it took a couple of tries before I got this to work properly, but when I got the import function to work, it was very easy to use.

ID Wizard

The ID Wizard is a very handy tool for all birders attempting to identify mysterious birds seen or heard in the field. A number of major and minor changes have been made to the ID wizard. Options for location (state/province), relative size, colour, habitat, field marks (crest/tufts, eye rings, white outer tail feathers, wing bars) have been carried to Version 5 from the previous version of the program. A major improvement was made to the ID wizard with the return of bird sounds. The bird sound options include 12 song/call types and four song pattern types. In this version, one can use taxonomic group (order, family, genus) as an identifying factor as well. In Version 5, one can generate useful custom lists and quizzes from the ID wizard in addition to the photo gallery displaying photos of all species in the final list with the selected identification characteristics. From the photo gallery, one can play sound recordings, zoom in on the displayed photo, choose primary or secondary photos, or jump to specific species accounts in the eField Guide View. Primary photos show males in breeding plumage and secondary photos show the females, juveniles, or birds in flight.

Custom Lists

With Version 5, one can easily create very useful custom lists. Several custom lists are included with the software. With available and self-generated custom lists, you can use the filter to select a custom list and use it to study specific birds, make singing screensavers, easily export songs and images to an iPod, iPhone, or MP3 player (a really useful function!), build your own quizzes, export custom lists, and use the photo gallery to view all birds on the custom list. Custom lists can be downloaded from Thayer Birding Software's Share Custom Lists Forum, they can be created by adding a single species at a time, or they can be created with the ID Wizard.

Bird Quizzes

The Bird Quizzes function is much improved with the addition of hundreds of additional quizzes including ones on Christmas Bird Counts in Calgary, Banff, Edmonton, Regina, Saskatoon, Prince Albert National Park, Winnipeg, Riding Mountain National Park, and Churchill. The combinations you can set up are almost endless, with many flexible options. There are now about 700 predefined quizzes with the software, with thousands of variations. The incredibly easy to use Quiz Wizard guides you through the steps to prepare a quiz. In addition to the predefined options, quizzes can be created from custom lists or by selecting a state or province or taxonomic group. My Quizzes is a new feature wherein you create your own quiz on any topic using your photos, songs, and video. There are four types of quizzes: Multiple Choice: Fill-in-the-Blank, Flash Cards, and Pick One. One can adjust the level of difficulty, use common or scientific names or band code as answers, select any photo, sound or video, map, randomize the questions, or play flash cards in a loop. Bird Quizzes is a fun and effective way to improve birding skills, especially for novice and developing birders and children. It has become the central feature and strength of the software.

Sighting Recording

A ‘lite’ version of the listing program, Birder's Diary, is included in Version 5. This section of the program is designed for experienced birders who like to maintain sighting records. This simple listing feature contains pull-down dialog boxes for species name, location (state/province), date, and observer and a comment field. This feature allows easy editing, addition, and deletion of sightings. It also allows electronic saving of your sighting data and the ability to sort by combinations of location, date, species name (taxonomic or common), and comments for generating life lists and sighting reports by taxonomic group and dates. This listing program accepts one observer name and does not allow you to export lists or sightings to other programs, although you can export custom lists. In Version 5, you can use your sightings to create custom lists. In order to have full listing program capabilities, you will need to purchase the compatible North America or World type of Birder's Diary.

System Requirements and Troubleshooting Help

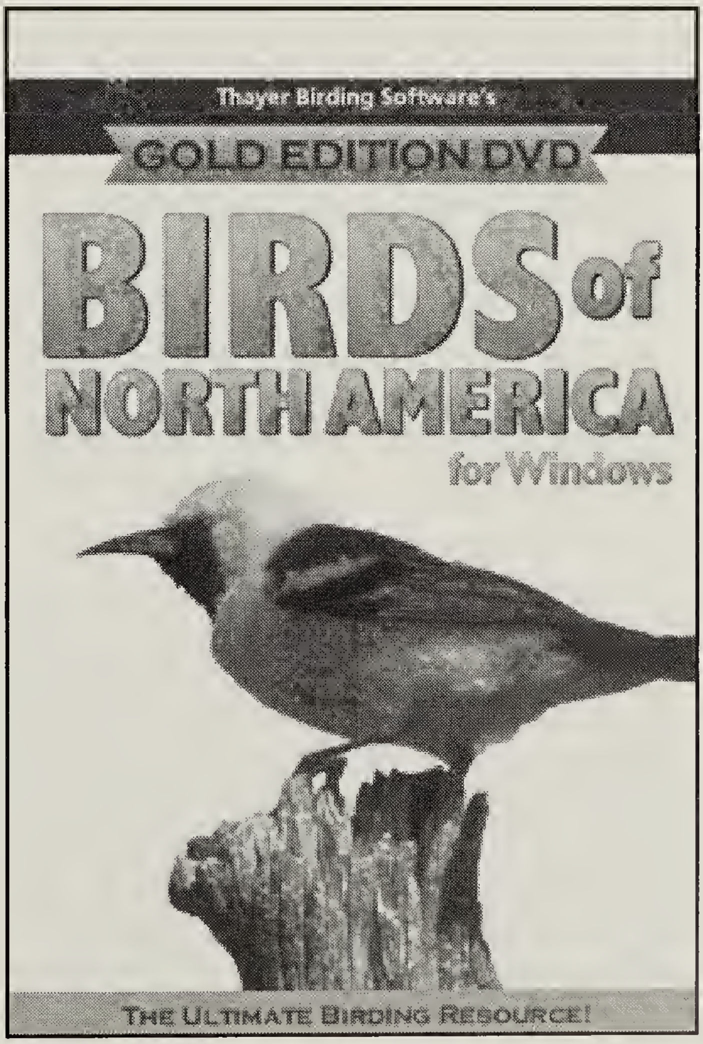
I have not had a serious problem with this 2-DVD set in a Windows XP environment with a Pentium 4 processor PC. It is designed to work with these Windows operating systems: XP, Vista, 64-bit, and Version 7. However, it does not work on a Mac. Loading the full program onto my computer was surprisingly quick and easy. Although there is no handy helpful guided tour of the program that can be printed out for easy reference, there are online video tutorials and an electronic help menu. The Thayer Birding Software website continues to have an excellent section on common software questions and answers to complement the enhanced electronic help. This site already contains an update for this DVD.

The Bottom Line

The DVD (Version 5) has numerous improvements over Version 3: better photos, improved range maps, enhanced similar species views, family plates, allowance of easy importation of photos, songs, and videos into the program, many more quizzes, improved bird sighting recording system, better list management, and improved online help. Although the price tag appears steep at US$165, you do get a lot of useful tools and information in this impressive and adaptable program. It has more useful and integrated features such as the ID wizard, My Quizzes, custom lists, sighting records, and more updated information than Birds of North America online, and you do not need to worry about renewing subscriptions. Therefore, I highly recommend this DVD set for all birders looking to improve their skills as part of their birding toolbox and personal library.

1. THAYER, P. W., and J. D. DIEHL. 2002. Birds of North America CD-ROM 3. Thayer Birding Software. Naples, FL. Reviewed by Robert Warnock. *Blue Jay* 60:120-121.

- Reviewed by Robert Warnock, 3603 White Bay, Regina, SK, S4S 7C9. E-mail: <warnockr@accesscomm.ca>



IN MEMORIAM: IAN LOCHTIE (1914-2009)

C. STUART HOUSTON, 863 University Drive, Saskatoon, SK, S7N 0J8

Only upon his death did we learn the formal name of Ian Lochtie, who had been christened John Blackley Lochtie. Ian was born on 29 September 1914 on a farm south of Leross and was made a Fellow of the Saskatchewan Natural History Society in 1995.

Ian was, as his niece Dorothy Fleming said in her memorial, "a gentle man who had a special tie to the land his father homesteaded more than 100 years ago." He had "a special bond with all the creatures who inhabited it. From the horses and cattle raised on the farm, the dogs and cats, to the wild deer and birds for which he cared each winter. He would proudly show the Red River cart trail on his virgin prairie." Ian's cats had a special entrance in his front door, and he kept the door open for them during cold winter nights. By leaving a large opening on one granary, he fed up to 1000 bushels of grain to the White-tailed Deer each winter.

All his life, Ian took long walks to observe nature in general and White-tailed Deer in particular. His spring walks took on a special purpose in 1967, when he learned through Doug Gilroy's column in the weekly Western Producer that a doctor in Saskatoon was banding Great Horned Owls. For the next 27 years, through 1992 when he found ten active owl nests (I ran out of steam before Ian did), Ian directed his walks during late April and early May on my behalf. Before nests were hidden by leaves, he went on foot to every tree that held a Red-tailed Hawk nest built in a previous year. On average, but varying with the position of the Snowshoe Hare cycle, Ian would visit three to ten former hawk nests to find one that was occupied by a pair of Great Horned Owls.

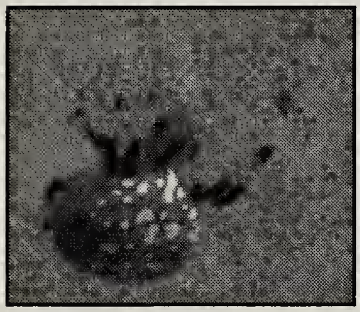
Ian Lochtie, 18 May 1991. Photo by David G. Miller

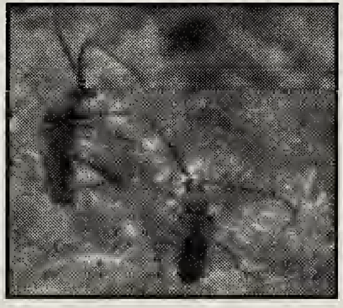
My owl climbers each year looked forward to meeting Ian. As we drove from nest to nest, we were regaled with stories of each family of deer. An Eastern Phoebe nest on a cultivator would be protected by Ian and that machine used only after the young had fledged. Ian became one of the top four owl nest finders in Saskatchewan, finding 126 successful Great Horned Owl nests where young were banded. He also recorded the number of owl nest failures.

Ian lived on his farm for 91 years, even after he became totally deaf in one ear when a poacher's rifle bullet went through one side of his skull; he was left for dead but revived and staggered back to his farm and phoned his nephew to take him to the hospital. His little home was heated by a wood stove, appropriate for his Scottish saying "lang may yir lum reek": long may your chimney smoke. His last three years were spent in the Balcarres Integrated Care Centre, where he died on 4 May 2009.

MYSTERY PHOTO

ANSWER TO THE SEPTEMBER 2009 MYSTERY PHOTO





Ronald Hooper of Fort Qu'Appelle, SK, was the first to respond to our beetle mystery. He wrote: "The beetles are longhorned beetles. The species name is *Crossidius coralinus* (LeConte). They are feeding at the blossoms of rabbitbrush *(Chrysothamnus nauseosus* [Pall.]) *Crossidius coralinus* has only been confirmed as occurring in Canada at Grasslands National Park, Saskatchewan, both east and west blocks. The adults feed at the flowers of rabbitbrush. The larvae burrow into the stems of rabbitbrush in some States, so they probably do so here in Saskatchewan."

David Larson of Maple Creek, SK, had initially identified the beetles as *Batyle suturalis*, a long-horned wood-boring beetle of the family Cerambycidae. However, upon further examination, he concluded the following: *"Batyle* and *Crossidius* are best separated from each other on the basis of the shape of the mandible - which unfortunately is not visible in the photo. However, *B. suturalis* tends to have less black than *C. coralinus*, where the base of the elytra are dark with the dark area extending out to the shoulders. *Batyle suturalis* has sparse, erect black setae arising from sparse deep punctures on the elytra. I couldn't make these out on the photo but assumed it was a problem of resolution. However, on closer examination it looks like denser, pale setae are present. Thus I would agree [that] the specimens best fit *Crossidius coralinus*. I was surprised to learn of two bright red longhorns on the southern prairies, and I understand from a checklist of Canadian beetles, another red species of *Crossidius* occurs in southern Alberta (and thus probably also in SK). I am regularly surprised by the diversity in the biota."

Regarding the spider, David suggested that "[t]he spider is an orb web spider. It is probably *Araneus trifolium* based on the conspicuously banded legs, the purplish color, and the angular spots. This large species builds orb webs in tall herbs and shrubs and is found across southern Canada." Other names for this species include "Shamrock Orb Weaver," "Shamrock Spider," and, appropriately enough for the Fall issue, "Pumpkin Spider."

We thank both readers for their insightful contributions.

DECEMBER 2009 MYSTERY PHOTO

Kerry Hecker (Manager, Last Mountain Lake National Wildlife Area) submitted these mystery photos (see inside back cover, bottom). An overall view of the site is shown on the left, with a close-up on the right. She writes the following: "Here are photos of the pink stuff that we discovered on May 6, 2009. The ice had just vanished completely, and this pink stuff was floating in small flat mats right near a rocky shoreline in a shallow small lake (just off [a] dam). I've not seen such stuff before, and didn't take the time to figure out what it was; likely some under-the-ice algal colony that was released when the ice melted. The colour in these photos is quite accurate. What a weird colour for something natural." Indeed, and yet we find it to be rather festive. Can anyone help solve the mystery?

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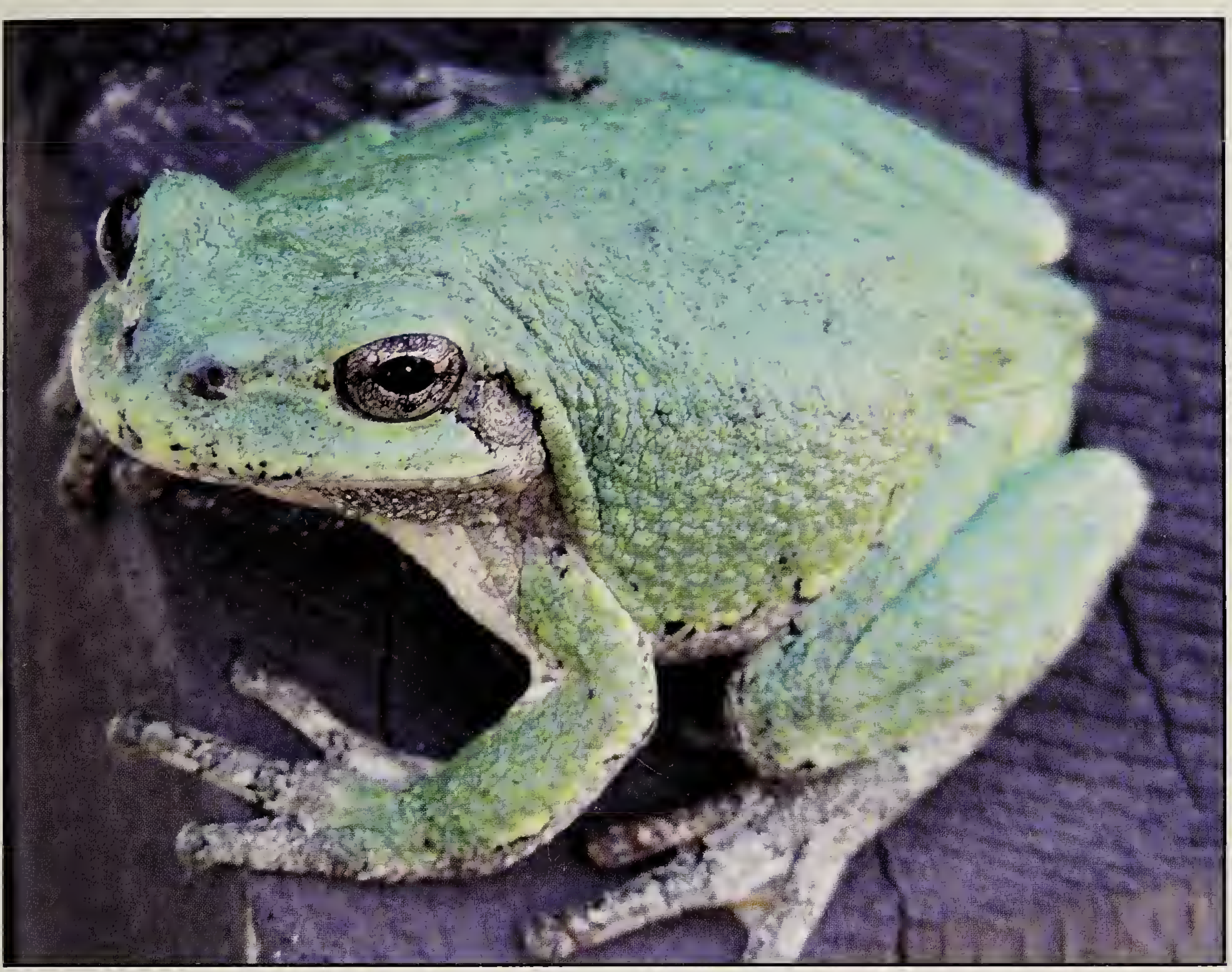
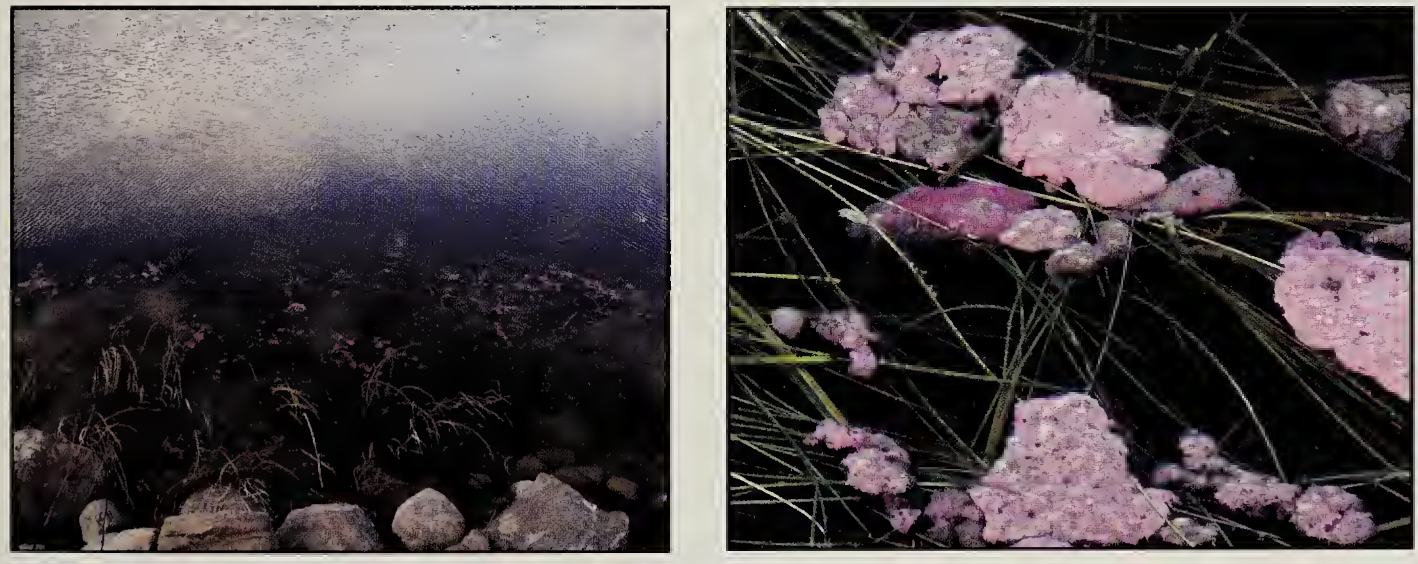


Figure 3. Gray Treefrog captured at the northernmost known locality in Manitoba, south of Grand Rapids, on 23 June 2008 (see text). See article by P. Taylor on p. 235. *Randy Mooi*



December 2009 Mystery Photos. Left panel: overview of the site; right panel: close-up of the mysterious pink sludge. See p. 267. *Kerry Hecker*

Front cover: *Winter porcupine.* *Christian Artuso*

Back cover: *Loggerhead Shrikes. See Photo Note by A. Baudru on p. 258.*
Alison Baudru

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